Billing Code

**DEPARTMENT OF THE INTERIOR**

**Fish and Wildlife Service**

**50 CFR Part 17**

**[Docket No. FWS–R4–ES–2018–0069; FF09E21000 FXES11110900000 212]**

**RIN 1018–BD36**

# Endangered and Threatened Wildlife and Plants; Endangered Species Status for Slenderclaw Crayfish and Designation of Critical Habitat

**AGENCY:** Fish and Wildlife Service, Interior.

**ACTION:** Final rule.

**SUMMARY:** We, the U.S. Fish and Wildlife Service (Service), determine endangered species status under the Endangered Species Act of 1973, as amended (Act), for the slenderclaw crayfish (*Cambarus cracens*), a cryptic freshwater crustacean that is endemic to streams on Sand Mountain within the Tennessee River Basin in DeKalb and Marshall Counties, Alabama. This rule adds this species to the Federal List of Endangered and Threatened Wildlife. In addition, we designate approximately 78 river miles (126 river kilometers) in DeKalb and Marshall Counties, Alabama, as critical habitat for the species under the Act.

**DATES:** This rule is effective [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

**ADDRESSES:** This final rule is available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R4–ES–2018–0069 and at *https://www.fws.gov/southeast/*. Comments and materials we received, as well as supporting documentation we used in preparing this rule, are available for public inspection at *http://www.regulations.gov* under Docket No. FWS–R4–ES–2018–0069. Comments, materials, and documentation that we considered in this rulemaking will be available by appointment, during normal business hours at: U.S. Fish and Wildlife Service,

Alabama Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT)**.

The coordinates or plot points or both from which the maps are generated are included in the administrative record for this critical habitat designation and are available at *http://www.regulations.gov* under Docket No. FWS–R4–ES–2018–0069, at *https://www.fws.gov/southeast/*, and at the Alabama Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**). Any additional tools or supporting information that we developed for this critical habitat designation will also be available at the Service website and Field Office set out above, and may also be included in the preamble and/or at *http://www.regulations.gov*.

**FOR FURTHER INFORMATION CONTACT:** William Pearson, Field Supervisor, U.S. Fish and Wildlife Service, Alabama Ecological Services Field Office, 1208-B Main Street, Daphne, AL 36526; telephone 251–441–5870. Persons who use a telecommunications device for the deaf (TDD) may call the Federal Relay Service at 800–877–8339.

**SUPPLEMENTARY INFORMATION:**

**Executive Summary**

*Why we need to publish a rule.* Under the Act, a species may warrant protection through listing if it is endangered or threatened throughout all or a significant portion of its range. In addition, to the maximum extent prudent and determinable, we must designate critical habitat for any species that we determine to be an endangered or threatened species under the Act. Listing a species as an endangered or threatened species and designation of critical habitat can only be completed by issuing a rule.

*What this rule does.* This rule will list the slenderclaw crayfish (*Cambarus cracens*) as an endangered species and will finalize the designation of critical habitat for the species under the Act. Accordingly, this rule revises part 17 of title 50 of the Code of Federal Regulations at 50 CFR 17.11 and 17.95.

*The basis for our action.* Under the Act, we may determine that a species is an endangered or threatened species based on any of five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. We have determined that the slenderclaw crayfish is threatened by competition from a nonnative species (Factors A and E) and habitat degradation resulting from poor water quality (Factor A).

Under section 4(a)(3) of the Act, if we determine that any species is an endangered or threatened species we must, to the maximum extent prudent and determinable, designate critical habitat. Under section 4(b)(2) of the Act, the Secretary shall designate critical habitat on the basis of the best available scientific data after taking into consideration the economic impact, national security impact, and any other relevant impact of specifying any particular area as critical habitat. Section 3(5)(A) of the Act defines critical habitat as (i) the specific areas within the geographical area occupied by the species, at the time it is listed, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protections; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed, upon a determination by the Secretary that such areas are essential for the conservation of the species.

*Economic analysis*. In accordance with section 4(b)(2) of the Act, we prepared a draft economic analysis of the impacts of designating critical habitat. We published an announcement of the completion of the draft and solicited public comments (83 FR 50582; October 9, 2018). We received no comments on the draft economic analysis. We adopt the draft economic analysis as final.

*Peer review and public comment.* We sought comments from independent specialists to ensure that our designation is based on scientifically sound data, assumptions, and analyses. We

invited these peer reviewers to comment on our species status assessment (SSA) report, which informed both the proposed rule and this final rule. We also considered all comments and information received from the public and peer reviewers during the comment period.

**Supporting Documents**

We prepared an SSA report for the slenderclaw crayfish. Written in consultation with species experts, the SSA report represents the best scientific and commercial data available concerning the status of the slenderclaw crayfish, including the impacts of past, present, and future factors (both adverse and beneficial) affecting the species (Service 2019, entire). The SSA report underwent independent peer review by scientists with expertise in crayfish biology, habitat management, and stressors (factors negatively affecting the species) to the slenderclaw crayfish. The SSA report, the proposed rule, this final rule, and other materials relating to this rulemaking can be found on the Service's Southeast Region website at *https://www.fws.gov/southeast/* and at *http://www.regulations.gov* under Docket No. FWS–R4–ES–2018–0069.

**Previous Federal Actions**

On October 9, 2018, we published in the *Federal Register* a proposed rule (83 FR 50582) to list the slenderclaw crayfish as a threatened species with provisions under section 4(d) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) and to designate critical habitat. Please refer to that proposed rule for a detailed description of all previous Federal actions concerning this species.

**Background**

The slenderclaw crayfish is a relatively small, cryptic freshwater crustacean, with an average lifespan of 2 to 3 years, that is endemic to streams on Sand Mountain within the Tennessee River Basin in DeKalb and Marshall Counties, Alabama. Primarily due to the invasion of nonnative virile crayfish (*Faxonius virilis*) that prey upon and compete with the slenderclaw crayfish, in addition to habitat degradation resulting in poor water quality, the

species' range is reduced with extirpation at some sites and low condition in both populations currently.

Please refer to the October 9, 2018, proposed listing and designation of critical habitat rule for the slenderclaw crayfish (83 FR 50582) and the SSA report for a full summary of species information. Both are available on the Service's Southeast Region website at *https://www.fws.gov/southeast/* and at *http://www.regulations.gov* under Docket No. FWS–R4–ES–2018–0069.

**Summary of Comments and Recommendations**

In the October 9, 2018, proposed listing and critical habitat rule (83 FR 50582), we requested that all interested parties submit written comments on the proposal by December 10, 2018. We also contacted appropriate Federal and State agencies, scientific experts and organizations, and other interested parties and invited them to comment on the proposal. A newspaper notice inviting general public comment was published in the Guntersville (Alabama) Advertiser Gleam on October 17, 2018. We did not receive any requests for a public hearing. All substantive information provided during the comment period has either been incorporated directly into the SSA report or this final determination or is addressed below, as appropriate.

*Peer Reviewer Comments*

In accordance with our joint policy on peer review published on July 1, 1994 (59 FR 34270), and our August 22, 2016, memorandum updating and clarifying the role of peer review of listing actions under the Act, we solicited the expert opinions from six knowledgeable individuals with scientific expertise that included familiarity with slenderclaw crayfish and its habitat, biological needs, and threats. We received responses from two peer reviewers.

We reviewed all comments received from the peer reviewers for substantive issues and new information regarding the slenderclaw crayfish, and we updated the SSA report prior to the proposed rule. The peer reviewers generally concurred with our methods and conclusions and provided additional information, clarifications, and suggestions to improve the final SSA report.

Peer reviewer comments were incorporated into the SSA report and this final rule as appropriate. In our response to peer reviewer comments, we only address issues that were not reflected in changes to the SSA report or this final rule.

*Comment:* One peer reviewer suggested that we project increased variability in rainfall instead of change in annual mean precipitation in our future condition projections. The reviewer noted that one historic drought could potentially eliminate one of these populations, and we do not understand the effects of flooding on the slenderclaw crayfish. In addition, the reviewer noted that considering climate-induced variability with urbanization could lead to a higher probability of occasional stream drying.

*Our response:* Although we did not use a model to project increased variability in rainfall as the commenter suggested, in the SSA, we did account for increased variability in rainfall and the hydrological impacts from precipitation change in our future-scenario projections and predictions of the slenderclaw crayfish. To assess the future condition of slenderclaw crayfish, we projected how precipitation can change in order to understand potential future hydrologic impacts within the system. Based on this information, we developed future scenarios on the plausible range in the hydrologic impacts from precipitation change as well as other factors influencing the viability of the slenderclaw crayfish.

*Public Comments*

We received 10 public comments on the proposed listing rule and critical habitat rule. Where commenters provided substantive comments or new information concerning the proposed listing and species-specific section 4(d) rule for the slenderclaw crayfish, we incorporated this information into the final SSA report and this final rule as appropriate.

*(1) Comment*: One commenter expressed concern about the presence of the virile crayfish in slenderclaw crayfish habitat and provided additional information and references on research of the effects of virile crayfish on other crayfish species. The commenter noted the

virile crayfish has been attributed to decline of other native crayfish species in rivers and streams in West Virginia, Idaho, Wyoming, and Utah.

*Our response*: We appreciate the additional information and references provided regarding the virile crayfish effects to other native crayfish species. We incorporated the information from the additional studies of virile crayfish into the appropriate section of the SSA report (Service 2019, pp. 16–17). We further considered the additional information about the invasion of virile crayfish and what the impact is to the current condition of the slenderclaw crayfish. After further consideration of the invasion of virile crayfish, coupled with the low abundance of slenderclaw crayfish, we determined the risk of extinction for the slenderclaw crayfish is higher (see **Determination of Slenderclaw Status**, below) than we characterized in the proposal to list the slenderclaw crayfish as a threatened species. Based on the documented past expansion of the virile crayfish, current invasion and expansion into the slenderclaw crayfish's range in both populations will occur. Therefore, the slenderclaw crayfish is currently at risk of extinction as a result of the virile crayfish expansion. We reassessed the best available scientific and commercial data available regarding the slenderclaw crayfish to evaluate its status under the Act (see **Determination of Slenderclaw Crayfish Status**, below).

*(2) Comment*: Several other commenters expressed their opinion that the Service should list the species as endangered, rather than threatened, and stated reasons including degradation of its habitat, inadequacy of existing regulatory mechanisms, small population size, competition with virile crayfish, and climate change. One commenter specifically identified kudzu (*Pueraria montana*), an invasive plant, as a current and future threat to the riparian habitat in the range of the slenderclaw crayfish. In addition, the commenter noted that degradation of habitat for the slenderclaw crayfish is ongoing despite existing regulatory mechanisms.

*Our response*: When we evaluated the best available information, we concluded that kudzu was not a threat to the slenderclaw crayfish. Although we recognize that kudzu can alter habitat, this plant has not been documented to impact the slenderclaw crayfish. As to habitat

degradation, as discussed under the **Summary of Biological Status and Threats** and **Determination** sections of the preamble of this final listing rule, we determined that existing regulatory mechanisms currently address the threat of habitat degradation. Other than identifying kudzu as a potential threat, the commenters did not provide any new information regarding current threats to the slenderclaw crayfish or its current status that was not already considered in the SSA report or proposed rule. However, as stated above under *Our Response* to *(1) Comment*, based on new information about the invasive virile crayfish, coupled with known information about slenderclaw crayfish abundance, we determined the slenderclaw crayfish meets the definition of an endangered species (see **Determination of Slenderclaw Crayfish Status**, below).

*(3) Comment*: Two commenters stated that the slenderclaw crayfish has been extirpated from 80 percent of its historical range, citing information from a status survey for three rare crayfishes, including the slenderclaw crayfish (Kilburn *et al.* 2012, entire).

*Our response*: As discussed in Kilburn *et al.* (2012, entire), the slenderclaw crayfish was only ever known to occur at five historical sites within two watersheds, Short and Town Creeks, and the authors did not find the slenderclaw crayfish outside these two watersheds. Since the publication of Kilburn *et al*. (2012, entire), recent surveys conducted in 2015 through 2017 identified the slenderclaw crayfish occurring at three new sites within this historical range. Although there is evidence of reduced abundance and presumed extirpation at four historical sites within this range, there are currently two populations of slenderclaw crayfish occurring across the range in Alabama, and the slenderclaw crayfish occurs within the two watersheds where it historically was known to occur. In short, at this time, the slenderclaw crayfish has not been extirpated from 80 percent of its historical range. Please refer to section 2.5 Range and Distribution in the SSA report for additional information on the historical and current range of the species.

*(4) Comment*: The Tennessee Valley Authority (TVA) recommended that the planting of bare-root seedlings as a method to revegetate and stabilize streambanks be included in the 4(d) rule. TVA has found this method to be successful for establishing a diversity of vegetation within riparian zones.

*Our response*: We agree that the planting of bare-root seedlings as a method to revegetate and stabilize streambanks would be beneficial to slenderclaw crayfish. However, in this final rule, the Service has determined that the slenderclaw crayfish meets the definition of an endangered species, and the Act does not allow issuance of a 4(d) rule for a species listed as endangered.

**Summary of Changes from the Proposed Rule**

The final rule incorporates changes to our proposed listing rule and SSA Report based on the comments we received, as discussed in the **Summary of Comments and Recommendations**. Based on comments received and our further consideration of the invasion of virile crayfish coupled with low abundance of slenderclaw crayfish, we determined the risk of extinction is higher (see **Determination**, below) than we characterized in the proposal to list the slenderclaw crayfish as a threatened species (83 FR 50582; October 9, 2018). We reassessed our analysis and found that the documented expansion and invasion of the virile crayfish in the slenderclaw crayfish's range, along with additional information regarding impacts to other native crayfish species and known low abundance in both populations of the slenderclaw crayfish, places the slenderclaw crayfish at a high risk for extinction throughout its range. Thus, after evaluating the best available information and the Act's regulation and policies, we determined that the slenderclaw crayfish meets the definition of an endangered species, and such status is more appropriate than that of a threatened species as originally proposed. Because we determined that the slenderclaw crayfish meets the definition of an endangered species, a 4(d) rule is inapplicable; consequently, the proposed special rule under the authority of section 4(d) of the Act was removed from the final rule. We received no substantive comments on the proposed

critical habitat designation; accordingly, there are no changes in the final designation. Lastly, we made minor editorial and nonsubstantive corrections throughout the SSA report and this final rule.

**Summary of Biological Status and Threats**

We completed a comprehensive assessment of the biological status of the slenderclaw crayfish and prepared an SSA report (Service 2019, entire), which provides a thorough account of the species' overall viability. Below, we summarize the key results and conclusions of the SSA report.

To evaluate the current and future viability of the slenderclaw crayfish, we assessed the three conservation biology principles of resiliency, redundancy, and representation (the "3 Rs" described in detail in the SSA report) (Shaffer and Stein 2000, pp. 306–310). Briefly, resiliency supports the ability of the species to withstand environmental and demographic stochasticity (for example, wet or dry, warm or cold years), redundancy supports the ability of the species to withstand catastrophic events (for example, droughts, large pollution events), and representation supports the ability of the species to adapt over time to long-term changes in the environment (for example, climate changes). In general, the more resilient and redundant a species is and the more representation it has, the more likely it is to sustain populations over time, even under changing environmental conditions. Using these principles, we identified the species' ecological requirements for survival and reproduction at the individual, population, and species levels, and described the beneficial and risk factors influencing the species' viability.

The historical range of the slenderclaw crayfish included two known populations, Short and Town Creeks, in watersheds leading into the Tennessee River in Alabama. Within the Short Creek population, a total of 90 slenderclaw crayfish, with 56 of those being juveniles, were collected during the period 1970–1974 (Bouchard and Hobbs 1976, entire; Schuster 2017, unpublished data). Historically, only one crayfish was collected in the Town Creek population in the period 1970–1974 (Bouchard and Hobbs 1976, entire; Schuster 2017, unpublished data).

Surveys conducted from 2009 through 2017 have documented the slenderclaw crayfish within the same two populations, Short Creek (three sites in Shoal Creek) and Town Creek (one site in Bengis Creek and one site in Town Creek) (Kilburn *et al*. 2014, pp. 116–117; Bearden *et al*. 2017, pp. 17–18; Schuster 2017, unpublished data; Taylor 2017, unpublished data).

Of the five historical sites, the slenderclaw crayfish is no longer found and is presumed extirpated at three sites in the Short Creek population (one site in Short Creek and two sites in Scarham Creek) and one site in the Town Creek population (one site in Bengis Creek) despite repeated survey efforts (Kilburn *et al*. 2014, pp. 116–117; Bearden *et al*. 2017, pp. 17–18; Schuster 2017, unpublished data; Taylor 2017, unpublished data). Across current survey efforts from 2009 through 2017, researchers collected 28 slenderclaw crayfish, including 2 juveniles, within the Short Creek population, and 2 adults and 2 juveniles from the Town Creek population. There are no actual historical or current population estimates for slenderclaw crayfish, and the abundance numbers (total number collected) reported are not population estimates.

At the population level, the overall current condition in terms of resiliency was determined to be low for both Short Creek and Town Creek populations. We estimate that the slenderclaw crayfish currently has some adaptive potential (*i.e.*, representation) due to the habitat variability features occurring in the Short Creek and Town Creek populations. The Short Creek population occurs in streams with predominantly large boulders and fractured bedrock, broader stream widths, and greater depths, and the Town Creek population occurs in streams with larger amounts of gravel and cobble, narrower stream widths, and shallower depths (Bearden 2017, pers. comm.). At present, the slenderclaw crayfish has two populations in low condition (resiliency) with habitat types that vary between populations. Therefore, given the variable habitat in which the slenderclaw crayfish occurs, the species may have some level of adaptive capacity. Given the low resiliency of both populations of the slenderclaw crayfish, current representation is reduced.

The slenderclaw crayfish exhibits limited redundancy given its narrow range and that four out of five sites within the species' historical range are presumed extirpated. In addition, connectivity between the Short Creek and Town Creek populations is likely low, because both Short and Town Creek streams flow downstream into, and thus are separated by, Guntersville Lake. To date, no slenderclaw crayfish have been documented in impounded areas including Guntersville Lake. Multiple sites in the same population could allow recolonization following a catastrophic event (*e.g.*, chemical spill) that may affect a large proportion of a population; however, given the species' limited redundancy and current low resiliency of both populations, it might be difficult to reestablish an entire population affected by a catastrophic event, as the connectivity between the two populations is low. Further, the currently occupied sites in the Short Creek population are in a single tributary, and one catastrophic event could impact this entire population.

*Risk Factors for Slenderclaw Crayfish*

The Act directs us to determine whether any species is an endangered species or a threatened species because of any factors affecting its continued existence. Under section 4(a)(1) of the Act, we may list a species based on (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence.

We reviewed the potential risk factors (*i.e.*, threats or stressors) that are affecting the slenderclaw crayfish now and are expected to affect it into the future. Because we have determined that the species is currently in danger of extinction throughout its range, in this final rule we will discuss in detail only those threats that we conclude are driving the current status and viability of the species. We have determined that competition from a nonnative species (Factors A and E), habitat degradation resulting from poor water quality (Factor A), and low

abundance (Factor E) pose the largest risk to the current viability of the slenderclaw crayfish. Other potential stressors to the species—hydrological variation and alteration (Factors A and E), land use (Factor A), and scientific collection (Factor B)—are discussed in the SSA report and proposed rule. Currently existing regulatory mechanisms, such as regulations implemented under the Clean Water Act to protect water quality and instream habitat, address the habitat degradation threat to the slenderclaw crayfish. However, we also found that existing regulatory mechanisms do not address, nor do they contribute to, the threat of the nonnative virile crayfish, which is the primary threat to the slenderclaw crayfish. We find the species does not face significant threats from disease or predation (Factor C). We also reviewed the conservation efforts being undertaken for the habitat in which the slenderclaw crayfish occurs.

Nonnative Species

The virile crayfish (*Faxonius virilis*), previously recognized as *Orconectes virilis* (Crandall and De Grave 2017, p. 5), is a crayfish native to the Missouri, upper Mississippi, lower Ohio, and the Great Lakes drainages (Service 2015, p. 1). The species has spread from its native range through dispersal as fishing bait, as pets, and through commercial (human) consumption (Schwartz *et al*. 1963, p. 267; Service 2015, p. 4). Virile crayfish inhabit a variety of watersheds in the United States, including those with very few to no native crayfish species, and have been found in lake, wetland, and stream environments (Larson *et al*. 2010, p. 2; Loughman and Simon 2011, p. 50). Virile crayfish are generalists, able to withstand various conditions, and have the natural tendency to migrate (Loughman and Simon 2011, p. 50). This species has been documented to spread approximately 124 mi (200 km) over 15 years (B. Williams 2018, pers. comm.; Williams *et al*. 2011, entire).

Based on comparison of body size, average claw size, aggression levels, and growth rates, it appears that the virile crayfish has an ecological advantage over several native crayfish species, including those in the *Cambarus* and *Procambarus* genera (Hale *et al*. 2016, p. 6). In

addition, virile crayfish have been documented to displace native crayfish (Hubert 2010, p. 5; Loughman and Welsh 2010, pp. 70 and 72).

Virile crayfish were first collected near the range of slenderclaw crayfish in 1967 (Schuster 2017, unpublished data). Since then, the virile crayfish has been documented in Guntersville Lake (a Tennessee Valley Authority reservoir constructed in 1939, on the Tennessee River mainstem) (Schuster 2017, unpublished data; Taylor 2017, unpublished data). In addition, the virile crayfish was found in 2015 at the type locality (location where the species was first described) for the slenderclaw crayfish in Short Creek (Short Creek population), in which the slenderclaw crayfish no longer occurs (Schuster 2017, unpublished data; Taylor 2017, unpublished data). In 2016, the virile crayfish was found at two sites in Drum Creek within the Short Creek population boundary and at the confluence of Short Creek and Guntersville Lake (Schuster 2017, unpublished data; Taylor 2017, unpublished data). During 2017, 20 virile crayfish were again found at the location where slenderclaw crayfish was first described in Short Creek (Taylor 2017, unpublished data). Also during 2017, this nonnative crayfish was documented at four new sites in adjacent watersheds outside of the Short Creek population boundary. Juvenile virile crayfish have been collected in the Short Creek population, indicating that the species is established there (Taylor 2017, unpublished data). To date, no virile crayfish have been documented within the Town Creek population boundary (Schuster 2017, unpublished data; Taylor 2017, unpublished data).

The adaptive nature of the virile crayfish, the effects of this nonnative species on other crayfish species in their native ranges, and records of the virile crayfish's presence in the slenderclaw crayfish's historical and current range indicate that the virile crayfish is a factor that negatively influences the viability of the slenderclaw crayfish in the near term and future. Also, considering that the virile crayfish is a larger crayfish, is a strong competitor, and tends to migrate, while the slenderclaw crayfish has low abundance and is a smaller bodied crayfish, it is

reasonable to conclude that once the virile crayfish is established at a site, it will out-compete slenderclaw crayfish.

Water Quality

Direct impacts of poor water quality on the slenderclaw crayfish are unknown; however, aquatic macroinvertebrates (*i.e*., mayflies, caddisflies, stoneflies) are negatively affected by poor water quality, and this may indirectly impact the slenderclaw crayfish, which likely feeds on them. Degradation of water quality impacts aquatic macroinvertebrates and may even cause stress to individual crayfish (Arthur *et al*. 1987, p. 328; Devi and Fingerman 1995, p. 749; Rosewarne *et al*. 2014, p. 69). Although crayfish generally have a higher tolerance to ammonia than some aquatic species (*i.e*., mussels), their food source, larval insects, is impacted by ammonia at lower concentrations (Arthur *et al*. 1987, p. 328). Juvenile slenderclaw crayfish likely feed exclusively on aquatic macroinvertebrates, which are impacted by elevated ammonia and poor water quality.

Within the range of the slenderclaw crayfish, Scarham Creek and Town Creek were identified as impaired waters by the Alabama Department of Environmental Management (ADEM). These creeks were listed in 1996 and 1998, respectively, on Alabama's list of impaired water bodies (list of waterbodies that do not meet established State water quality standards) under section 303(d) of the Clean Water Act (hereafter, "the 303(d) list") (ADEM 1996, p. 1; ADEM 2001, p. 11). Scarham Creek was placed on the 303(d) list for impacts from pesticides, siltation, ammonia, low dissolved oxygen/organic enrichment, and pathogens from agricultural sources; this section of Scarham Creek stretched 24 mi (39 km) upstream from its confluence with Short Creek to its source (ADEM 2013, p. 1). However, Scarham Creek was removed from Alabama's 303(d) list of impaired waters in 2004, after the total maximum daily loads (TMDLs; maximum amount of a pollutant or pollutants allowed in a water body while still meeting water quality standards) were developed in 2002 (ADEM 2002, p. 5; ADEM 2006, entire). Town Creek was previously listed on the 303(d) list for ammonia and organic

enrichment/dissolved oxygen impairments. Although TMDLs have been in development for these issues (ADEM 1996, entire), all of Town Creek is currently on the 303(d) list for mercury contamination due to atmospheric deposition (ADEM 2016a, appendix C). One identified source of wastewater discharge to Town Creek is Hudson Foods near Geraldine, Alabama (ADEM 1996, p. 1).

Pollution from nonpoint sources stemming from agriculture, animal production, and unimproved roads has been documented within the range of the slenderclaw crayfish (Bearden *et al*. 2017, p. 18). Alabama is ranked third in the United States for broiler (chicken) production (Alabama Poultry Producers 2017, unpaginated), and DeKalb and Marshall Counties are two of the four most active counties in Alabama for poultry farming (Conner 2008, unpaginated). Poultry farms and poultry litter (a mixture of chicken manure, feathers, spilled food, and bedding material that frequently is used to fertilize pastureland or row crops) have been documented to contain nutrients, pesticides, bacteria, heavy metals, and other pathogens (Bolan *et al*. 2010, pp. 676–683; Stolz *et al*. 2007, p. 821). A broiler house containing 20,000 birds will produce approximately 150 tons of litter a year (Ritz and Merka 2013, p. 2). Surface-spreading of litter allows runoff from heavy rains to carry nutrients from manure into nearby streams. Poultry litter spreading is a practice that occurs within the Short Creek watershed (Short Creek population of slenderclaw crayfish) (Top of Alabama Regional Council of Governments 2015, p. 8).

During recent survey efforts, water quality was impaired due to nutrients and bacteria within the Short Creek population, and levels of atrazine may be of concern in the watershed (Bearden *et al*. 2017, p. 32). In Bengis Creek (Town Creek population), lead measurements exceeded the acute and chronic aquatic life criteria set by the U.S. Environmental Protection Agency (EPA) and ADEM (Bearden *et al*. 2017, p. 32; ADEM 2017, p. 10-7). These criteria are based on levels developed by the EPA and ADEM to protect fish and wildlife (ADEM 2017, entire), and exceedance of these values is likely to harm animal or plant life (EPA 2018b, unpaginated). Elevated ammonia concentrations in Town Creek were also documented and

reflected nonpoint source pollution at low-flow and high-flow measurements (Bearden *et al*. 2017, p. 21). In late summer and fall surveys, potential eutrophication likely stemming from low-water conditions, elevated nutrients, and low dissolved oxygen was documented within both Short and Town Creek watersheds (Bearden *et al*. 2017, p. 31).

Low Abundance

The number of slenderclaw crayfish is currently low, with only two populations and few individuals within each population, which is reflected in the species' low resiliency, redundancy, and representation. The current estimated low abundance (n=32) and genetic drift may negatively affect populations of the slenderclaw crayfish. In general, the fewer populations a species has or the smaller the sizes of those populations, the greater the likelihood of extinction by chance alone (Shaffer and Stein 2000, p. 307). Genetic drift occurs in all species but is more likely to negatively affect populations that have a smaller effective population size (Caughley 1994, pp. 219–220; Huey *et al.* 2013, p. 10). There are only two populations of the slenderclaw crayfish with limited connectivity between those populations, which may have reduced genetic diversity. However, no testing for genetic drift has been conducted for the slenderclaw crayfish.

Synergistic Effects

In addition to impacting the species individually, it is likely that several of the risk factors are acting synergistically or additively on the species. The combined impact of multiple stressors is likely more harmful than a single stressor acting alone. For example, in the Town Creek watershed, Town Creek was previously listed as an impaired stream due to ammonia and organic enrichment/dissolved oxygen impairments, and recent surveys documented eutrophic conditions of elevated nutrients and low dissolved oxygen. In addition, hydrologic variation and alteration has occurred within the Town Creek watershed as discussed further in the SSA report. Low-water conditions naturally occur in streams where the slenderclaw crayfish occurs, and alteration causing prolonged low-water periods could have a negative impact on the reproductive success of the slenderclaw crayfish. Further, connectivity between Town Creek and

Short Creek watersheds is likely low due to Guntersville Lake. The combination of all of these stressors on the sensitive aquatic species in this habitat has probably impacted slenderclaw crayfish, in that only four individuals have been recorded there since 2009.

Conservation Actions

TMDLs have been developed in Scarham Creek for siltation, ammonia, pathogens, organic enrichment/low dissolved oxygen, and pesticides (ADEM 2002, p. 5). Town Creek is currently on the 303(d) list for mercury contamination due to atmospheric deposition (ADEM 2016a, appendix C). However, a TMDL for organic enrichment/dissolved oxygen has been developed for Town Creek (ADEM 1996, entire). Through the 303(d) program, ADEM provides funding derived under section 319 of the Clean Water Act to improve water quality in the watersheds. In 2014, the Upper Scarham Creek Watershed was selected as a priority by ADEM for the development of a watershed management plan. In Fiscal Year 2016, the DeKalb County Soil and Water Conservation District contracted with ADEM to implement the Upper Scarham Creek Watershed Project using section 319 funding (ADEM 2016b, p. 39).

The U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) National Water Quality Initiative program identified the Guntersville Lake/Upper Scarham Creek in DeKalb County as an Alabama Priority Watershed in 2015 (NRCS 2017, unpaginated). This watershed is within the historical range of the slenderclaw crayfish. It is recognized as in need of conservation practices, as it was listed on the Alabama 303(d) list as impaired due to organic enrichment/low dissolved oxygen and ammonia as nitrogen (ADEM 2002, p. 4). The National Water Quality Initiative helps farmers, ranchers, and forest landowners improve water quality and aquatic habitats in impaired streams through conservation and management practices. Such practices include controlling and trapping nutrient and manure runoff, and installation of cover crops, filter strips, and terraces.

*Future Condition of the Slenderclaw Crayfish*

For the purpose of this assessment, we define viability as the ability of the species to sustain populations in the wild over time. As part of the SSA, to help address uncertainty associated with the degree and extent of potential future stressors and their impacts on the needs of the species, the concepts of resiliency, redundancy, and representation were applied using three plausible future scenarios. We devised these scenarios by identifying information on the following primary stressors that are anticipated to affect the species in the future: nonnative virile crayfish, hydrological variation (precipitation and water quantity), land-use change, and water quality. However, having determined that the current condition of the slenderclaw crayfish is consistent with that of an endangered species (see **Determination of Slenderclaw Crayfish Status**, below), the results of the future scenarios are not material to our decision, and therefore, we are not presenting the results in this final rule. Please refer to the proposed listing and designation of critical habitat rule for the slenderclaw crayfish (83 FR 50582; October 9, 2018) and the SSA report (Service 2018, entire) for the full analysis of future conditions and descriptions of the associated scenarios.

**Determination of Slenderclaw Crayfish Status**

We have carefully assessed the best scientific and commercial information available regarding the past, present, and future threats to the slenderclaw crayfish. Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species meets the definition of an endangered species or a threatened species. The Act defines an endangered species as a species "in danger of extinction throughout all or a significant portion of its range," and a threatened species as a species "likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." The Act requires that we determine whether a species meets the definition of "endangered species" or "threatened species" because of any of the following factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) Overutilization for commercial, recreational, scientific, or educational purposes; (C) Disease or

predation; (D) The inadequacy of existing regulatory mechanisms; or (E) Other natural or manmade factors affecting its continued existence.

*Status Throughout All of Its Range*

After evaluating threats to the species and assessing the cumulative effect of the threats under the section 4(a)(1) factors, we have determined the slenderclaw crayfish to be endangered throughout all of its range. Our review of the best available information indicates that there are currently two populations of slenderclaw crayfish in low condition occurring across the species' historical range in Alabama. Despite the species being identified at three new sites as reflected by recent increased survey efforts, there is substantial evidence of reduced abundance (current estimate of n=32) and presumed extirpation at four historical sites. In the Short Creek population, 28 slenderclaw crayfish were collected during surveys from 2009 through 2017; in the Town Creek population, only 4 slenderclaw crayfish were collected during this same time period. Further, there is evidence of limited reproduction with only 3 juveniles collected from both populations since 2016. The slenderclaw crayfish exhibits low natural redundancy given its narrow range, but given presumed extirpation of sites within both populations, the species' redundancy is further limited.

Several sources of indirect water quality impacts on both populations have been identified. However, no direct water quality-related impacts are known at this time, and crayfish generally have a higher tolerance to poor water quality conditions than other aquatic species. In addition, currently existing regulatory mechanisms, such as establishing TMDLs, are addressing the effects of poor water quality on the slenderclaw crayfish.

Currently, one of the primary threats to the slenderclaw crayfish is the nonnative virile crayfish. The virile crayfish is a larger crayfish, a strong competitor, and tends to migrate, and has been attributed to declines of other native crayfish species. Considering these characteristics of the virile crayfish and the size (small-bodied) of the slenderclaw crayfish, it is reasonable to infer that once virile crayfish is established at a site it will out-compete slenderclaw crayfish.

This may already be the case at the slenderclaw crayfish type locality where virile crayfish were found in recent surveys. At present, the virile crayfish has been reported as occurring at only one site, the type locality, where the slenderclaw crayfish was known to occur. Specifically, the virile crayfish occupies approximately 12.5 river miles (mi) (20.1 river kilometers (km)) at a few sites approximately 7 river mi (11 river km) downstream of current slenderclaw crayfish sites in the Short Creek population (233.6 river mi (375.9 river km)), and, therefore, the virile crayfish is an imminent threat to slenderclaw crayfish in the Short Creek population. Although there are currently no records of the virile crayfish in the Town Creek population (281.7 river mi (453.4 river km)), the virile crayfish is documented in Guntersville Lake, which leads directly into the Town Creek population. Based on the documented past expansion of the virile crayfish (despite some uncertainty and variation in the rate at which it will expand), and documented impacts and declines to other native crayfish species, current invasion and expansion into the slenderclaw crayfish's range in the Town Creek population will occur. Coupled with the current low abundance (n=4) of slenderclaw crayfish in the Town Creek population, the invasion of virile crayfish makes the slenderclaw crayfish at high risk of extirpation in this watershed.

Overall, given the current low resiliency in both populations and the species' limited redundancy, it will be difficult to reestablish an entire population, should it be affected by a catastrophic event, without human intervention, as the connectivity between the two populations is low.

Therefore, the slenderclaw crayfish is currently at risk of extirpation in both populations. Thus, we have determined that the slenderclaw crayfish is currently in danger of extinction throughout all of its range.

*Status Throughout a Significant Portion of Its Range*

Under the Act and our implementing regulations, a species may warrant listing if it is in danger of extinction or likely to become so in the foreseeable future throughout all or a significant portion of its range. We have determined that the slenderclaw crayfish is in danger of

extinction throughout all of its range, warranting listing as endangered throughout its range. Accordingly, we did not undertake an analysis of any significant portion of its range. Our determination is consistent with the decision in *Center for Biological Diversity* v. *Everson*, 2020 WL 437289 (D.D.C. Jan. 28, 2020).

*Determination of Status*

Our review of the best available scientific and commercial information indicates that the slenderclaw crayfish meets the definition of an endangered species. Therefore, in accordance with sections 3(20) and 4(a)(1) of the Act, we add the slenderclaw crayfish as an endangered species to the List of Endangered and Threatened Wildlife at 50 CFR 17.11(h).

**Available Conservation Measures**

The primary purpose of the Act is the conservation of endangered and threatened species and the ecosystems upon which they depend. The ultimate goal of such conservation efforts is the recovery of these listed species, so that they no longer need the protective measures of the Act. Conservation measures provided to species listed as endangered or threatened species under the Act include recognition, recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing results in public awareness and conservation by Federal, State, Tribal, and local agencies, private organizations, and individuals. The Act encourages cooperation with the States and calls for recovery actions to be carried out for all listed species. The protection required by Federal agencies and the prohibitions against certain activities are discussed, in part, below.

Subsection 4(f) of the Act requires the Service to develop and implement recovery plans for the conservation of endangered and threatened species. The recovery planning process involves the identification of actions that are necessary to halt or reverse the species' decline by addressing the threats to its survival and recovery. The goal of this process is to restore listed species to a point where they are secure, self-sustaining, and functioning components of their ecosystems.

Recovery planning consists of preparing draft and final recovery plans, beginning with the development of a recovery outline and making it available to the public within 30 days of a final listing determination. The recovery outline guides the immediate implementation of urgent recovery actions and describes the process to be used to develop a recovery plan. Revisions of the plan may be done to address continuing or new threats to the species, as new substantive information becomes available. The recovery plan also identifies recovery criteria for review of when a species may be ready for reclassification from endangered to threatened ("downlisting") or removal from protected status ("delisting"), and methods for monitoring recovery progress. Recovery plans also establish a framework for agencies to coordinate their recovery efforts and provide estimates of the cost of implementing recovery tasks. Recovery teams (composed of species experts, Federal and State agencies, nongovernmental organizations, and stakeholders) are often established to develop recovery plans. When completed, the recovery outline, draft recovery plan, and the final recovery plan will be available on our website (*http://www.fws.gov/endangered*) or from our Alabama Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Implementation of recovery actions generally requires the participation of a broad range of partners, including other Federal agencies, States, Tribes, nongovernmental organizations, businesses, and private landowners. Examples of recovery actions include habitat restoration (*e.g.*, restoration of native vegetation), research, captive propagation and reintroduction, and outreach and education. The recovery of many listed species cannot be accomplished solely on Federal lands because their range may occur primarily or solely on non-Federal lands. To achieve recovery of these species requires cooperative conservation efforts on private, State, and Tribal lands.

Following publication of this final listing rule, funding for recovery actions will be available from a variety of sources, including Federal budgets, State programs, and cost share grants for non-Federal landowners, the academic community, and nongovernmental

organizations. In addition, pursuant to section 6 of the Act, the State of Alabama will be eligible for Federal funds to implement management actions that promote the protection or recovery of the slenderclaw crayfish. Information on our grant programs that are available to aid species recovery can be found at: *http://www.fws.gov/grants*.

Please let us know if you are interested in participating in recovery efforts for the slenderclaw crayfish. Additionally, we invite you to submit any new information on this species whenever it becomes available and any information you may have for recovery planning purposes (see **FOR FURTHER INFORMATION CONTACT**).

Section 7(a) of the Act requires Federal agencies to evaluate their actions with respect to any species that is listed as an endangered or threatened species and with respect to its critical habitat. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(2) of the Act requires Federal agencies to ensure that activities they authorize, fund, or carry out are not likely to jeopardize the continued existence of any endangered or threatened species or destroy or adversely modify its critical habitat. If a Federal action may affect a listed species or its critical habitat, the responsible Federal agency must enter into consultation with the Service.

Federal agency actions within the slenderclaw crayfish's habitat that may require conference or consultation or both as described in the preceding paragraph include management and any other landscape-altering activities on Federal lands administered by the U.S. Fish and Wildlife Service and U.S. Forest Service; technical assistance and projects funded through the U.S. Department of Agriculture's NRCS; issuance of permits by the Tennessee Valley Authority for right-of-way stream crossings; issuance of section 404 Clean Water Act (33 U.S.C. 1251 *et seq*.) permits by the U.S. Army Corps of Engineers; and construction and maintenance of roads or highways by the Federal Highway Administration.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to endangered wildlife. The prohibitions of section 9(a)(1) of the Act,

codified at 50 CFR 17.21, make it illegal for any person subject to the jurisdiction of the United States to take (which includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect; or to attempt any of these) endangered wildlife within the United States or on the high seas. In addition, it is unlawful to import; export; deliver, receive, carry, transport, or ship in interstate or foreign commerce in the course of commercial activity; or sell or offer for sale in interstate or foreign commerce any species listed as an endangered species. It is also illegal to possess, sell, deliver, carry, transport, or ship any such wildlife that has been taken illegally. Certain exceptions apply to employees of the Service, the National Marine Fisheries Service, other Federal land management agencies, and State conservation agencies.

We may issue permits to carry out otherwise prohibited activities involving endangered wildlife under certain circumstances. Regulations governing permits are codified at 50 CFR 17.22. With regard to endangered wildlife, a permit may be issued for the following purposes: for scientific purposes, to enhance the propagation or survival of the species, and for incidental take in connection with otherwise lawful activities. There are also certain statutory exemptions from the prohibitions, which are found in sections 9 and 10 of the Act.

It is our policy, as published in the *Federal Register* on July 1, 1994 (59 FR 34272), to identify, to the maximum extent practicable at the time a species is listed, those activities that would or would not constitute a violation of section 9 of the Act. The intent of this policy is to increase public awareness of the effect of a final listing on proposed and ongoing activities within the range of a listed species. Based on the best available information, at this time, we are unable to identify specific activities that would not be considered to result in a violation of section 9 of the Act, because it is likely that site-specific conservation measures may be needed for activities that may directly or indirectly affect the slenderclaw crayfish. Based on the best available information, the following actions may potentially result in a violation of section 9 of the Act or this final rule; this list is not comprehensive:

(1) Unauthorized handling, collecting, possessing, selling, delivering, carrying, or transporting of the slenderclaw crayfish, including interstate transportation across State lines and import or export across international boundaries.

(2) Destruction/alteration of the species' habitat by discharge of fill material, draining, ditching, tiling, pond construction, stream channelization or diversion, or diversion or alteration of surface or ground water flow into or out of the stream (*i.e.*, due to roads, impoundments, discharge pipes, stormwater detention basins, etc.).

(3) Introduction of nonnative species that compete with or prey upon the slenderclaw crayfish, such as the introduction of nonnative virile crayfish in Alabama.

(4) Modification of the channel or water flow of any stream in which the slenderclaw crayfish is known to occur.

(5) Discharge of chemicals or fill material into any waters in which the slenderclaw crayfish is known to occur.

Questions regarding whether specific activities would constitute a violation of section 9 of the Act should be directed to the Alabama Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

**Critical Habitat Designation**

**Background**

Critical habitat is defined in section 3 of the Act as:

(1) The specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the Act, on which are found those physical or biological features

(a) Essential to the conservation of the species, and

(b) Which may require special management considerations or protection; and

(2) Specific areas outside the geographical area occupied by the species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

Our regulations at 50 CFR 424.02 define the geographical area occupied by the species as an area that may generally be delineated around species' occurrences, as determined by the Secretary (*i.e.*, range). Such areas may include those areas used throughout all or part of the species' life cycle, even if not used on a regular basis (*e.g.*, migratory corridors, seasonal habitats, and habitats used periodically, but not solely by vagrant individuals).

Conservation, as defined under section 3 of the Act, means to use and the use of all methods and procedures that are necessary to bring an endangered or threatened species to the point at which the measures provided pursuant to the Act are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resources management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and transplantation, and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regulated taking.

Critical habitat receives protection under section 7 of the Act through the requirement that Federal agencies ensure, in consultation with the Service, that any action they authorize, fund, or carry out is not likely to result in the destruction or adverse modification of critical habitat. The designation of critical habitat does not affect land ownership or establish a refuge, wilderness, reserve, preserve, or other conservation area. Designation also does not allow the government or public to access private lands, nor does designation require implementation of restoration, recovery, or enhancement measures by non-Federal landowners. Where a landowner requests Federal agency funding or authorization for an action that may affect a listed species or critical habitat, the Federal agency would be required to consult with the Service under section 7(a)(2) of the Act. However, even if the Service were to conclude that the proposed activity would result in destruction or adverse modification of the critical habitat, the Federal action agency and the landowner are not required to abandon the proposed activity, or to restore or recover the species; instead, they must implement "reasonable and prudent alternatives" to avoid destruction or adverse modification of critical habitat.

Under the first prong of the Act's definition of critical habitat, areas within the geographical area occupied by the species at the time it was listed are included in a critical habitat designation if they contain physical or biological features (1) which are essential to the conservation of the species and (2) which may require special management considerations or protection. For these areas, critical habitat designations identify, to the extent known using the best scientific and commercial data available, those physical or biological features that are essential to the conservation of the species (such as space, food, cover, and protected habitat). In identifying those physical or biological features within an area, we focus on the specific features that support the life-history needs of the species, including but not limited to, water characteristics, soil type, geological features, prey, vegetation, symbiotic species, or other features. A feature may be a single habitat characteristic, or a more complex combination of habitat characteristics. Features may include habitat characteristics that support ephemeral or dynamic habitat conditions. Features may also be expressed in terms relating to principles of conservation biology, such as patch size, distribution distances, and connectivity.

Under the second prong of the Act's definition of critical habitat, we may designate critical habitat in areas outside the geographical area occupied by the species at the time it is listed, upon a determination that such areas are essential for the conservation of the species. We will determine whether unoccupied areas are essential for the conservation of the species by considering the life-history, status, and conservation needs of the species. This consideration will be further informed by any generalized conservation strategy, criteria, or outline that may have been developed for the species to provide a substantive foundation for identifying which features and specific areas are essential to the conservation of the species and, as a result, the development of the critical habitat designation. For example, an area currently occupied by the species but that was not occupied at the time of listing may be essential to the conservation of the species and may be included in the critical habitat designation.

Section 4 of the Act requires that we designate critical habitat on the basis of the best scientific data available. Further, our Policy on Information Standards under the Endangered Species Act (published in the *Federal Register* on July 1, 1994 (59 FR 34271)), the Information Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Pub. L. 106-554; H.R. 5658)), and our associated Information Quality Guidelines, provide criteria, establish procedures, and provide guidance to ensure that our decisions are based on the best scientific data available. They require our biologists, to the extent consistent with the Act and with the use of the best scientific data available, to use primary and original sources of information as the basis for recommendations to designate critical habitat.

When we are determining which areas should be designated as critical habitat, our primary source of information is generally the information from the SSA report and information developed during the listing process for the species. Additional information sources may include any generalized conservation strategy, criteria, or outline that may have been developed for the species; the recovery plan for the species; articles in peer-reviewed journals; conservation plans developed by States and counties; scientific status surveys and studies; biological assessments; other unpublished materials; or experts' opinions or personal knowledge.

Habitat is dynamic, and species may move from one area to another over time. We recognize that critical habitat designated at a particular point in time may not include all of the habitat areas that we may later determine are necessary for the recovery of the species. For these reasons, a critical habitat designation does not signal that habitat outside the designated area is unimportant or may not be needed for recovery of the species. Areas that are important to the conservation of the species, both inside and outside the critical habitat designation, will continue to be subject to: (1) Conservation actions implemented under section 7(a)(1) of the Act; (2) regulatory protections afforded by the requirement in section 7(a)(2) of the Act for Federal agencies to ensure their actions are not likely to jeopardize the continued existence of any endangered or threatened species; and (3) section 9 of the Act's prohibitions on taking any

individual of the species, including taking caused by actions that affect habitat. Federally funded or permitted projects affecting listed species outside their designated critical habitat areas may still result in jeopardy findings in some cases. These protections and conservation tools will continue to contribute to recovery of this species. Similarly, critical habitat designations made on the basis of the best available information at the time of designation will not control the direction and substance of future recovery plans, habitat conservation plans, or other species conservation planning efforts if new information available at the time of these planning efforts calls for a different outcome.

On August 27, 2019, we published a final rule in the *Federal Register* (84 FR 45020) to amend our regulations concerning the procedures and criteria we use to designate and revise critical habitat. That rule became effective on September 26, 2019, but, as stated in that rule, the amendments it sets forth apply to "rules for which a proposed rule was published after September 26, 2019." We published our proposed critical habitat designation for the slenderclaw crayfish on October 9, 2018 (83 FR 50582); therefore, the amendments set forth in the August 27, 2019, final rule (84 FR 45020) do not apply to this final designation of critical habitat for the slenderclaw crayfish.

**Physical or Biological Features**

In accordance with section 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12(b), in determining which areas within the geographical area occupied by the species at the time of listing to designate as critical habitat, we consider the physical or biological features that are essential to the conservation of the species and which may require special management considerations or protection. The regulations at 50 CFR 424.02 define "physical or biological features essential to the conservation of the species" as the features that occur in specific areas and that are essential to support the life-history needs of the species, including, but not limited to, water characteristics, soil type, geological features, sites, prey, vegetation, symbiotic species, or other features. A feature may be a single habitat characteristic or a more complex combination

of habitat characteristics. Features may include habitat characteristics that support ephemeral or dynamic habitat conditions. Features may also be expressed in terms relating to principles of conservation biology, such as patch size, distribution distances, and connectivity. For example, physical features might include gravel of a particular size required for spawning, alkali soil for seed germination, protective cover for migration, or susceptibility to flooding or fire that maintains necessary early-successional habitat characteristics. Biological features might include prey species, forage grasses, specific kinds or ages of trees for roosting or nesting, symbiotic fungi, or a particular level of nonnative species consistent with conservation needs of the listed species. The features may also be combinations of habitat characteristics and may encompass the relationship between characteristics or the necessary amount of a characteristic needed to support the life history of the species. In considering whether features are essential to the conservation of the species, the Service may consider an appropriate quality, quantity, and spatial and temporal arrangement of habitat characteristics in the context of the life-history needs, condition, and status of the species. These include, but are not limited to:

(1) Space for individual and population growth and for normal behavior;

(2) Food, water, air, light, minerals, or other nutritional or physiological requirements;

(3) Cover or shelter;

(4) Sites for breeding, reproduction, or rearing (or development) of offspring; and

(5) Habitats that are protected from disturbance or are representative of the historical, geographical, and ecological distributions of a species.

We derive the specific physical or biological features essential for slenderclaw crayfish from studies of this species' and similar crayfish species' habitat, ecology, and life history. The primary habitat elements that influence resiliency of the slenderclaw crayfish include water quantity, water quality, substrate, interstitial space, and habitat connectivity. More detail of the habitat and resource needs are summarized in the *Habitat* section of the proposed listing designation of critical habitat rule for the slenderclaw crayfish (83 FR 50582; October 9, 2018)

and the SSA report. We use the ADEM water quality standards for fish and wildlife criteria to determine the minimum standards of water quality necessary for the slenderclaw crayfish. A full description of the needs of individuals, populations, and the species is available from the SSA report; the resource needs of individuals are summarized below in Table 1.

Table 1—Resource needs for slenderclaw crayfish to complete each life stage.

| Life Stage | Resources Needed |
|---|---|
| Fertilized Eggs | • Female to carry eggs<br>• Water to oxygenate eggs<br>• Female to fan eggs to prevent sediment buildup and oxygenate water as needed<br>• Female to shelter in boulder/cobble substrate and available interstitial space |
| Juveniles | • Female to carry juveniles in early stage<br>• Water<br>• Food (likely aquatic macroinvertebrates)<br>• Boulder/cobble substrate and available interstitial space for shelter |
| Adults | • Water<br>• Food (likely omnivorous, opportunistic, and generalist feeders)<br>• Boulder/cobble substrate and available interstitial space for shelter |

*Summary of Essential Physical or Biological Features*

In summary, we derive the specific physical or biological features essential to the conservation of the slenderclaw crayfish from studies of this species' and similar crayfish species' habitat, ecology, and life history, as described above. Additional information can be found in the SSA report (Service 2019, entire) available on *http://www.regulations.gov* under Docket No. FWS–R4–ES–2018–0069. We have determined that the following physical or biological features are essential to the conservation of the slenderclaw crayfish:

(1) Geomorphically stable, small to medium, flowing streams:

(a) That are typically 19.8 feet (ft) (6 meters (m)) wide or smaller;

(b) With attributes ranging from:

(i) Streams with predominantly large boulders and fractured bedrock, with widths from 16.4 to 19.7 ft (5 to 6 m), low to no turbidity, and depths up to 2.3 ft (0.7 m), to

(ii) Streams dominated by small substrate types with a mix of cobble, gravel, and sand, with widths of approximately 9.8 feet (3 m), low to no turbidity, and depths up to 0.5 feet (0.15 m);

(c) With substrate consisting of boulder and cobble containing abundant interstitial spaces for sheltering and breeding; and

(d) With intact riparian cover to maintain stream morphology and to reduce erosion and sediment inputs.

(2) Seasonal water flows, or a hydrologic flow regime (which includes the severity, frequency, duration, and seasonality of discharge over time), necessary to maintain benthic habitats where the species is found and to maintain connectivity of streams with the floodplain, allowing the exchange of nutrients and sediment for maintenance of the crayfish's habitat and food availability.

(3) Appropriate water and sediment quality (including, but not limited to, conductivity; hardness; turbidity; temperature; pH; and minimal levels of ammonia, heavy metals, pesticides, animal waste products, and nitrogen, phosphorus, and potassium fertilizers) necessary to sustain natural physiological processes for normal behavior, growth, and viability of all life stages.

(4) Prey base of aquatic macroinvertebrates and detritus. Prey items may include, but are not limited to, insect larvae, snails and their eggs, fish and their eggs, and plant and animal detritus.

**Special Management Considerations or Protection**

When designating critical habitat, we assess whether the specific areas within the geographical area occupied by the species at the time of listing contain features that are essential to the conservation of the species and which may require special management considerations or protection. The features essential to the conservation of the slenderclaw crayfish may require special management considerations or protections to reduce the following threats: (1) Impacts from invasive species, including the nonnative virile crayfish; (2) nutrient pollution from

agricultural activities that impact water quantity and quality; (3) significant alteration of water quality and water quantity, including conversion of streams to impounded areas; (4) culvert and pipe installation that creates barriers to movement; and (5) other watershed and floodplain disturbances that release sediments or nutrients into the water.

Management activities that could ameliorate these threats include, but are not limited to: Control and removal of introduced invasive species; limiting the spreading of poultry litter to time periods of dry, stable weather conditions; use of best management practices designed to reduce sedimentation, erosion, and bank side destruction; protection of riparian corridors and retention of sufficient canopy cover along banks; moderation of surface and ground water withdrawals to maintain natural flow regimes; and reduction of other watershed and floodplain disturbances that release sediments, pollutants, or nutrients into the water.

**Criteria Used To Identify Critical Habitat**

As required by section 4(b)(2) of the Act, we use the best scientific data available to designate critical habitat. In accordance with the Act and our implementing regulations at 50 CFR 424.12(b), we review available information pertaining to the habitat requirements of the species and identify specific areas within the geographical area occupied by the species at the time of listing and any specific areas outside the geographical area occupied by the species to be considered for designation as critical habitat.

The current distribution of the slenderclaw crayfish is much reduced from its historical distribution in one (Short Creek watershed) of the two populations. The currently occupied sites in the Short Creek watershed occur in a single tributary (Shoal Creek), and one catastrophic event could impact this entire population. In addition, the nonnative virile crayfish occupies sites within the Short Creek watershed, including the type locality for the slenderclaw crayfish in Short Creek in which the slenderclaw crayfish no longer occurs. We anticipate that recovery will require continued protection of existing populations and habitat, as well as establishing sites in additional streams that more closely approximate its historical distribution in order to ensure

there are adequate numbers of crayfish in stable populations and that these populations have multiple sites occurring in at least two streams within each watershed. This goal will help ensure that catastrophic events, such as a chemical spill, cannot simultaneously affect all known populations.

Sources of data for this critical habitat designation include numerous survey reports on streams throughout the species' range and databases maintained by crayfish experts and universities (Bouchard and Hobbs 1976, entire; Bearden 2017, unpublished data; Schuster 2017, unpublished data; Taylor 2017, unpublished data; Service 2018, entire). We have also reviewed available information that pertains to the habitat requirements of this species. Sources of information on habitat requirements include surveys conducted at occupied sites and published in agency reports, and data collected during monitoring efforts.

*Areas Occupied at the Time of Listing*

For locations within the geographic area occupied by the species at the time of listing, we identified stream channels that currently support populations of the slenderclaw crayfish. We defined "current" as stream channels with observations of the species from 2009 to the present. Due to the recent breadth and intensity of survey efforts for the slenderclaw crayfish throughout the historical range of the species, it is reasonable to assume that streams with no positive surveys since 2009 should not be considered occupied for the purpose of our analysis. Within these areas, we delineated critical habitat unit boundaries using the following process:

We evaluated habitat suitability of stream channels within the geographical area occupied at the time of listing, and retained for further consideration those streams that contain one or more of the physical or biological features to support life-history functions essential to conservation of the species. We refined the starting and ending points of units by evaluating the presence or absence of appropriate physical or biological features. We selected the headwaters as upstream cutoff points for each stream and downstream cutoff points that omit areas that are not suitable habitat. For example, the Guntersville Lake Tennessee Valley Authority project

boundary was selected as an endpoint for one unit, as there was a change to unsuitable parameters (*e.g.*, impounded waters).

Based on this analysis, the following streams meet criteria for areas occupied by the species at the time of listing: Bengis Creek, Scarham Creek, Shoal Creek, Short Creek, Town Creek, and Whippoorwill Creek (see *Unit Descriptions*, below). This list does not include all stream segments known to have been occupied by the species historically; rather, it includes only the occupied stream segments within the historical range that have also retained one or more of the physical or biological features that will allow for the maintenance and expansion of existing populations.

*Areas Outside the Geographical Area Occupied at the Time of Listing*

To consider for designation areas not occupied by the species at the time of listing, we must demonstrate that these areas are essential for the conservation of the species. To determine if these areas are essential for the conservation of the slenderclaw crayfish, we considered the life history, status, habitat elements, and conservation needs of the species such as:

(1) The importance of the stream to the overall status of the species, the importance of the stream to the prevention of extinction, and the stream's contribution to future recovery of the slenderclaw crayfish;

(2) whether the area is and could be maintained or restored to contain the necessary habitat (water quantity, substrate, interstitial space, and connectivity) to support the slenderclaw crayfish;

(3) whether the site provides connectivity between occupied sites for genetic exchange;

(4) whether a population of the species could be reestablished in the location; and

(5) whether the virile crayfish is currently present in the stream.

For the one subunit containing areas outside the geographical area occupied by the species at the time of listing, we delineated critical habitat unit boundaries by evaluating stream segments not known to have been occupied at listing (*i.e.*, outside of the geographical area

occupied by the species) but that are within the historical range of the species to determine if they are essential for the survival and recovery of the species. Essential areas are those that:

(a) Expand the geographical distribution within areas not occupied at the time of listing across the historical range of the species;

(b) Were determined to be of suitable habitat and contain the primary habitat elements (water quantity, substrate, interstitial space, and connectivity) that support the viability of the slenderclaw crayfish; and

(c) Are connected to other occupied areas, which will enhance genetic exchange between populations.

Based on this analysis, Scarham-Laurel Creek was identified as meeting the criteria for areas outside the geographical area occupied at the time of listing that are essential for the conservation of the species (see Subunit 2b unit description below).

*General Information on the Maps of the Critical Habitat Designation*

When determining critical habitat boundaries, we made every effort to avoid including developed areas such as lands covered by buildings, pavement, and other structures because such lands lack physical or biological features necessary for slenderclaw crayfish. The scale of the maps we prepared under the parameters for publication within the Code of Federal Regulations may not reflect the exclusion of such developed lands. Any such lands inadvertently left inside critical habitat boundaries shown on the maps of this final rule have been excluded by text in the rule and are not included for designation as critical habitat. Therefore, a Federal action involving these lands would not trigger section 7 consultation under the Act with respect to critical habitat and the requirement of no adverse modification unless the specific action would affect the physical or biological features in the adjacent critical habitat.

We are designating critical habitat in areas within the geographical area occupied by the species at the time of listing. We also are designating areas outside the geographical area occupied by the species at the time of listing that were historically occupied but are presently

unoccupied, because we have determined that such areas are essential for the conservation of the species (see description of Subunit 2b below for explanation).

The two occupied units were designated based on one or more of the elements of physical or biological features being present to support slenderclaw crayfish life processes. Some stream segments within the units contained all of the identified elements of physical or biological features and supported multiple life processes. Some stream segments contained only some elements of the physical or biological features necessary to support the slenderclaw crayfish's particular use of that habitat.

The critical habitat designation is defined by the map or maps, as modified by any accompanying regulatory text, presented at the end of this document in the rule portion. We include more detailed information on the boundaries of the critical habitat designation in the discussion of individual units below. We will make the coordinates or plot points or both on which each map is based available to the public on *http://www.regulations.gov* under Docket No. FWS–R4–ES–2018–0069, and at the field office responsible for the designation (see **FOR FURTHER INFORMATION CONTACT**, above).

**Final Critical Habitat Designation**

We are designating approximately 78 river mi (126 river km) in two units as critical habitat for the slenderclaw crayfish. The critical habitat areas, described below, constitute our current best assessment of areas that meet the definition of critical habitat for the slenderclaw crayfish. The two units are: (1) Town Creek Unit, and (2) Short Creek Unit. Unit 2 is subdivided into two subunits: (2a) Shoal Creek and Short Creek subunit, and (2b) Scarham-Laurel Creek subunit. Table 2 shows the name, occupancy of the unit, land ownership of the riparian areas surrounding the units, and approximate river miles of the designated critical habitat units for the slenderclaw crayfish.

Table 2—Designated critical habitat units for the slenderclaw crayfish.

| Stream(s) | Occupied at the Time of Listing | Ownership | Length of Unit in River Miles (Kilometers) |
|---|---|---|---|
| Unit 1—Town Creek | | | |
| Bengis and Town Creeks | Yes | Private | 42 (67) |
| Unit 2—Short Creek | | | |
| Subunit 2a—Shoal Creek and Short Creek | | | |
| Scarham, Shoal, Short, and Whippoorwill Creeks | Yes | Private | 10 (17) |
| Subunit 2b—Scarham-Laurel Creek | | | |
| Scarham-Laurel Creek | No | Private | 26 (42) |
| Total | | | 78 (126) |

Note: Area sizes may not sum due to rounding.

We present brief descriptions of all units, and reasons why they meet the definition of critical habitat for the slenderclaw crayfish, below.

Unit 1: Town Creek

Unit 1 consists of 41.8 river mi (67.2 river km) of Bengis and Town creeks in DeKalb County, Alabama. Unit 1 includes stream habitat up to bank full height, consisting of the headwaters of Bengis Creek to its confluence with Town Creek and upstream to the headwaters of Town Creek. Stream channels in and lands adjacent to Unit 1 are privately owned except for bridge crossings and road easements, which are owned by the State and County. The slenderclaw crayfish occupies all stream reaches in this unit, and the unit currently supports all breeding, feeding, and sheltering needs essential to the conservation of the slenderclaw crayfish.

Special management considerations or protection may be required for control and removal of introduced invasive species, including the nonnative virile crayfish, which occupies the boulder and cobble habitats and interstitial spaces within these habitats that the slenderclaw crayfish needs. At present, the virile crayfish is not present in this unit, although it has been documented just outside the watershed boundary. However, based on future projections in the

SSA report, the virile crayfish is expected to be present in the Town Creek watershed within the next 2 years.

In addition, special management considerations or protection may be required to address water withdrawals and drought as well as excess nutrients, sediment, and pollutants that enter the streams and serve as indicators of other forms of pollution, such as bacteria and toxins. A primary source of these types of pollution is agricultural runoff. However, during recent survey efforts for the slenderclaw crayfish, water quality analysis found lead measurements in Bengis Creek that exceeded the acute and chronic aquatic life criteria set by EPA and ADEM, and elevated ammonia concentrations in Town Creek. Special management or protection may include moderating surface and ground water withdrawals, using best management practices to reduce sedimentation, and reducing watershed and floodplain disturbances that release pollutants and nutrients into the water.

Unit 2: Short Creek

*Subunit 2a—Shoal Creek and Short Creek:* Subunit 2a consists of 10.3 river mi (16.6 river km) of Scarham, Shoal, Short, and Whippoorwill Creeks in DeKalb and Marshall Counties, Alabama. Subunit 2a includes stream habitat up to bank full height, consisting of the headwaters of Shoal Creek to its confluence with Whippoorwill Creek, Whippoorwill Creek to its confluence with Scarham Creek, Scarham Creek to its confluence with Short Creek, and Short Creek downstream to the Guntersville Lake Tennessee Valley Authority project boundary. Stream channels in and lands adjacent to subunit 2a are privately owned except for bridge crossings and road easements, which are owned by the State and Counties. The slenderclaw crayfish occupies all stream reaches in this unit, and the unit currently supports all breeding, feeding, and sheltering needs essential to the conservation of the slenderclaw crayfish.

Special management considerations or protection may be required for control and removal of introduced invasive species, including the virile crayfish (see Unit 1 discussion, above). At present, the virile crayfish is present at sites in Short Creek and Drum Creek within

the Short Creek watershed and just outside of the unit boundary in Guntersville Lake. Based on future projections in the SSA report, the virile crayfish is expected to be present in more tributaries within the Short Creek watershed within the next 2 to 5 years.

In addition, special management considerations or protection may be required to address water withdrawals and drought as well as excess nutrients, sediment, and pollutants that enter the streams and serve as indicators of other forms of pollution such as bacteria and toxins. A primary source of these types of pollution is agricultural runoff. During recent survey efforts for the slenderclaw crayfish, water quality analysis indicated that impaired water quality due to nutrients, bacteria, and levels of atrazine may be of concern in the Short Creek watershed. Special management or protection may include moderating surface and ground water withdrawals, using best management practices to reduce sedimentation, and reducing watershed and floodplain disturbances that release pollutants and nutrients into the water.

*Subunit 2b—Scarham-Laurel Creek:* Subunit 2b consists of 25.9 river mi (41.7 river km) of Scarham-Laurel Creek in DeKalb and Marshall Counties, Alabama. Subunit 2b includes stream habitat up to bank full height, consisting of the headwaters of Scarham-Laurel Creek to its confluence with Short Creek. Stream channels in and lands adjacent to Subunit 2b are privately owned except for bridge crossings and road easements, which are owned by the State and Counties. The subunit is connected to Subunit 2a.

This subunit is unoccupied by the species but is considered to be essential for the conservation of the species. Scarham-Laurel Creek is within the historical range of the slenderclaw crayfish but is not within the geographical range occupied by the species at the time of listing. The slenderclaw crayfish has not been documented at sites in Scarham-Laurel Creek in over 40 years, and we presume those historically occupied sites to be extirpated. Scarham-Laurel Creek is a small to medium, flowing stream with substrate consisting of boulder and cobble containing interstitial spaces for sheltering and breeding. Although it is currently unoccupied, this subunit contains some or all of the physical or biological features necessary for

the conservation of the slenderclaw crayfish. This subunit possesses characteristics as described by physical or biological feature 1 (geomorphically stable, small to medium, flowing streams with substrate consisting of boulder and cobble and intact riparian cover); physical or biological feature 2 (seasonal water flows, or a hydrologic flow regime, necessary to maintain benthic habitats where the species is found and to maintain connectivity of streams); and physical or biological feature 4 (prey base of aquatic macroinvertebrates and detritus). Physical or biological feature 3 (appropriate water and sediment quality) is degraded in this subunit, and with appropriate management and restoration actions, this feature can be restored.

In terms of water quality, Scarham-Laurel Creek is in restorable condition, and is currently devoid of the virile crayfish. Water quality concerns have been documented within Scarham-Laurel Creek, causing it to be listed on Alabama's 303(d) list of impaired waters for impacts from pesticides, siltation, ammonia, low dissolved oxygen/organic enrichment, and pathogens from agricultural sources in 1998 (ADEM 1996, p. 1). In 2004, Scarham Creek was removed from the 303(d) list after TMDLs were established (ADEM 2002, p. 5); however, recent water quality analysis indicated that water quality was impaired within the Short Creek watershed in which Scarham-Laurel Creek is located (Bearden *et al*. 2017, p. 32). When the water quality of Scarham-Laurel Creek is restored, the stream could be an area for population expansion within the Short Creek watershed, in that this subunit is connected to the occupied Shoal Creek and Short Creek subunit, and thereby provide redundancy needed to support the species' recovery. Therefore, we conclude that this stream is essential for the conservation of the slenderclaw crayfish, because it will provide habitat for population expansion in known historical habitat that is necessary to increase viability of the species by increasing its resiliency, redundancy, and representation.

**Exemptions**

*Application of Section 4(a)(3) of the Act*

Section 4(a)(3)(B)(i) of the Act (16 U.S.C. 1533(a)(3)(B)(i)) provides that the Secretary shall not designate as critical habitat any lands or other geographical areas owned or controlled by the Department of Defense, or designated for its use, that are subject to an integrated natural resources management plan (INRMP) prepared under section 101 of the Sikes Act (16 U.S.C. 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation. There are no Department of Defense lands with a completed INRMP within the final critical habitat designation.

**Exclusions**

*Consideration of Impacts under Section 4(b)(2) of the Act*

Section 4(b)(2) of the Act states that the Secretary shall designate and make revisions to critical habitat on the basis of the best available scientific data after taking into consideration the economic impact, national security impact, and any other relevant impact of specifying any particular area as critical habitat. The Secretary may exclude an area from critical habitat if she determines that the benefits of such exclusion outweigh the benefits of specifying such area as part of the critical habitat, unless she determines, based on the best scientific data available, that the failure to designate such area as critical habitat will result in the extinction of the species. In making that determination, the statute on its face, as well as the legislative history, are clear that the Secretary has broad discretion regarding which factor(s) to use and how much weight to give to any factor.

*Consideration of Economic Impacts*

Section 4(b)(2) of the Act and its implementing regulations require that we consider the economic impact that may result from a designation of critical habitat. In order to consider economic impacts, we prepared an incremental effects memorandum (IEM) and screening analysis which together with our narrative and interpretation of effects we consider our draft economic analysis (DEA) of the proposed critical habitat designation and related factors (IEc 2018, entire). The analysis, dated June 29, 2018, addressed probable economic impacts of

critical habitat designation for the slenderclaw crayfish. The DEA was made available for public review from October 9, 2018, through December 10, 2018 (Industrial Economics, Inc. (IEc) 2018, entire), but we did not receive any comments on the draft DEA. Additional information relevant to the probable incremental economic impacts of critical habitat designation for the slenderclaw crayfish is summarized below and available in the screening analysis for the slenderclaw crayfish (IEc 2018, entire), available at *http://www.regulations.gov*.

The final critical habitat designation for the slenderclaw crayfish totals approximately 78 river mi (126 river km), which includes both occupied and unoccupied streams. This final critical habitat designation is likely to result, annually, in a maximum of three informal section 7 consultations and five technical assistance efforts at a total incremental cost of less than $10,000 per year. Within the occupied streams, any actions that may affect the species would likely also affect critical habitat, and it is unlikely that any additional conservation efforts would be required to address the adverse modification standard over and above those recommended as necessary to avoid jeopardizing the continued existence of the species. Within all unoccupied critical habitat, the Service will consult with Federal agencies on any projects that occur within the hydrologic unit code (HUC) 12-digit watershed boundaries, due to overlap with the ranges of other listed species such as Indiana bat (*Myotis sodalis*), gray bat (*Myotis grisescens*), northern long-eared bat (*Myotis septentrionalis*), harperella (*Ptilimnium nodosum*), and green pitcher-plant (*Sarracenia oreophila*) in these HUCs. In addition, all of the HUC 12-digit watershed boundaries containing unoccupied habitat are within the HUC 12-digit range of watersheds occupied by slenderclaw crayfish. Thus, no incremental project modifications resulting solely from the presence of unoccupied critical habitat are anticipated. Therefore, the only additional costs that are expected in all of the critical habitat designation are administrative costs, due to the fact that this additional analysis will require time and resources by both the Federal action agency and the Service.

*Exclusions Based on Economic Impacts*

As discussed above, the Service considered the economic impacts of the critical habitat designation and the Secretary is not exercising her discretion to exclude any areas from this designation of critical habitat for the slenderclaw crayfish based on economic impacts. A copy of the IEM and screening analysis with supporting documents may be obtained by contacting the Alabama Ecological Services Field Office (see **ADDRESSES**) or by downloading from the Internet at *http://www.regulations.gov*.

*Exclusions Based on Impacts on National Security and Homeland Security*

Section 4(a)(3)(B)(i) of the Act may not cover all Department of Defense (DoD) lands or areas that pose potential national-security concerns (*e.g.*, a DoD installation that is in the process of revising its INRMP for a newly listed species or a species previously not covered). If a particular area is not covered under section 4(a)(3)(B)(i), national-security or homeland-security concerns are not a factor in the process of determining what areas meet the definition of "critical habitat." Nevertheless, when designating critical habitat under section 4(b)(2) of the Act, the Service must consider impacts on national security, including homeland security, on lands or areas not covered by section 4(a)(3)(B)(i) of the Act. Accordingly, we will always consider for exclusion from the designation areas for which DoD, Department of Homeland Security (DHS), or another Federal agency has requested exclusion based on an assertion of national-security or homeland-security concerns. However, no lands within the designation of critical habitat for slenderclaw crayfish are owned or managed by DoD or DHS. Consequently, the Secretary is not exercising her discretion to exclude any areas from the final designation based on impacts on national security.

*Exclusions Based on Other Relevant Impacts*

Under section 4(b)(2) of the Act, we consider any other relevant impacts, in addition to economic impacts and impacts on national security. We consider a number of factors including whether there are permitted conservation plans covering the species in the area, such as habitat

conservation plans, safe harbor agreements, or candidate conservation agreements with assurances, or whether there are non-permitted conservation agreements and partnerships that would be encouraged by designation of, or exclusion from, critical habitat. In addition, we look at the existence of Tribal conservation plans and partnerships and consider the government-to-government relationship of the United States with Tribal entities. We also consider any social impacts that might occur because of the designation.

In preparing this final rule, we have determined that there are currently no permitted conservation plans or other non-permitted conservation agreements or partnerships for the slenderclaw crayfish, and the final critical habitat designation does not include any Tribal lands or trust resources. We anticipate no impact on Tribal lands, partnerships, permitted or non-permitted plans, or agreements from this critical habitat designation. Accordingly, the Secretary is not exercising her discretion to exclude any areas from the final designation based on other relevant impacts.

**Effects of Critical Habitat Designation**

*Section 7 Consultation*

Section 7(a) of the Act requires Federal agencies to evaluate their actions with respect to critical habitat of any species that is listed as an endangered or threatened species. Regulations implementing this interagency cooperation provision of the Act are codified at 50 CFR part 402. Section 7(a)(2) of the Act requires Federal agencies, including the Service, to ensure that any action they fund, authorize, or carry out is not likely to result in the destruction or adverse modification of designated critical habitat of any listed species. In addition, section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any agency action that is likely to result in the destruction or adverse modification of proposed critical habitat.

We published a final regulation with a revised definition of destruction or adverse modification on August 27, 2019 (84 FR 45020). Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for

the conservation of a listed species. If a Federal action may affect a listed species' critical habitat, the responsible Federal agency (action agency) must enter into consultation with us. Examples of actions that are subject to the section 7 consultation process are actions on State, Tribal, local, or private lands that require a Federal permit (such as a permit from the U.S. Army Corps of Engineers under section 404 of the Clean Water Act (33 U.S.C. 1251 *et seq*.) or a permit from the Service under section 10 of the Act) or that involve some other Federal action (such as funding from the Federal Highway Administration, Federal Aviation Administration, or the Federal Emergency Management Agency). Federal actions not affecting listed species or critical habitat—and actions on State, Tribal, local, or private lands that are not federally funded, authorized, or carried out by a Federal agency—do not require section 7 consultation.

Compliance with the requirements of section 7(a)(2) of the Act is documented through our issuance of:

(1) A concurrence letter for Federal actions that may affect, but are not likely to adversely affect, critical habitat; or

(2) A biological opinion for Federal actions that may affect, and are likely to adversely affect, critical habitat.

When we issue a biological opinion concluding that a project is likely to destroy or adversely modify critical habitat, we provide reasonable and prudent alternatives to the project, if any are identifiable, that would avoid the likelihood of destruction or adverse modification of critical habitat. We define "reasonable and prudent alternatives" (50 CFR 402.02) as alternative actions identified during consultation that:

(1) Can be implemented in a manner consistent with the intended purpose of the action,

(2) Can be implemented consistent with the scope of the Federal agency's legal authority and jurisdiction,

(3) Are economically and technologically feasible, and

(4) Would, in the Service Director's opinion, avoid the likelihood of destroying or adversely modifying critical habitat.

Reasonable and prudent alternatives can vary from slight project modifications to extensive redesign or relocation of the project. Costs associated with implementing a reasonable and prudent alternative are similarly variable.

Regulations at 50 CFR 402.16 set forth requirements for Federal agencies to reinitiate formal consultation on previously reviewed actions. These requirements apply when the Federal agency has retained discretionary involvement or control over the action (or the agency's discretionary involvement or control is authorized by law) and, subsequent to the previous consultation, we have listed a new species or designated critical habitat that may be affected by the Federal action, or the action has been modified in a manner that affects the species or critical habitat in a way not considered in the previous consultation. In such situations, Federal agencies sometimes may need to request reinitiation of consultation with us, but the regulations also specify some exceptions to the requirement to reinitiate consultation on specific land management plans after subsequently listing a new species or designating new critical habitat. See the regulations for a description of those exceptions.

*Application of the "Adverse Modification" Standard*

The key factor related to the destruction or adverse modification determination is whether implementation of the proposed Federal action directly or indirectly alters the designated critical habitat in a way that appreciably diminishes the value of the critical habitat as a whole for the conservation of the listed species. As discussed above, the role of critical habitat is to support physical or biological features essential to the conservation of a listed species and provide for the conservation of the species.

Section 4(b)(8) of the Act requires us to briefly evaluate and describe, in any proposed or final regulation that designates critical habitat, activities involving a Federal action that may

violate section 7(a)(2) of the Act by destroying or adversely modifying such habitat, or that may be affected by such designation.

Activities that the Services may find are likely to destroy or adversely modify critical habitat, during a consultation under section 7(a)(2) of the Act, include, but are not limited to:

(1) Actions that would alter the minimum flow or the existing flow regime. Such activities could include, but are not limited to, impoundment, channelization, water diversion, and water withdrawal. These activities could eliminate or reduce the habitat necessary for the growth and reproduction of the slenderclaw crayfish by decreasing or altering seasonal flows to levels that would adversely affect the species' ability to complete its life cycle.

(2) Actions that would significantly alter water chemistry or quality. Such activities could include, but are not limited to, release of chemicals (including pharmaceuticals, metals, and salts) or biological pollutants into the surface water or connected groundwater at a point source or by dispersed release (non-point source). These activities could alter water conditions to levels that are beyond the tolerances of the slenderclaw crayfish and result in direct or cumulative adverse effects to these individuals and their life cycles.

(3) Actions that would significantly increase sediment deposition within the stream channel. Such activities could include, but are not limited to, excessive sedimentation from livestock grazing, road construction, channel alteration, poor forestry management, off-road vehicle use, and other watershed and floodplain disturbances. These activities could eliminate or reduce the habitat necessary for the growth and reproduction of the slenderclaw crayfish by increasing the sediment deposition to levels that would adversely affect the species' ability to complete its life cycle.

(4) Actions that would significantly increase eutrophic conditions. Such activities could include, but are not limited to, release of nutrients into the surface water or connected groundwater at a point source or by dispersed release (non-point source). These activities can result in excessive nutrients and algae filling streams and reducing habitat for the slenderclaw

crayfish, degrading water quality from excessive nutrients and during algae decay, and decreasing oxygen levels to levels below the tolerances of the slenderclaw crayfish.

(5) Actions that would significantly alter channel morphology or geometry or decrease connectivity. Such activities could include, but are not limited to, channelization, impoundment, road and bridge construction, mining, dredging, and destruction of riparian vegetation. These activities may lead to changes in water flows and levels that would degrade or eliminate the slenderclaw crayfish and its habitats. These actions can also lead to increased sedimentation and degradation in water quality to levels that are beyond the tolerances of the slenderclaw crayfish.(6) Actions that result in the introduction, spread, or augmentation of nonnative aquatic species in occupied stream segments, or in stream segments that are hydrologically connected to occupied stream segments, or introduction of other species that compete with or prey on the slenderclaw crayfish. Possible actions could include, but are not limited to, stocking of nonnative crayfishes and fishes, stocking of sport fish, or other related actions. These activities can introduce parasites or disease; result in direct predation or direct competition; or affect the growth, reproduction, and survival of the slenderclaw crayfish.

**Required Determinations**

*Regulatory Planning and Review (Executive Orders 12866 and 13563)*

Executive Order 12866 provides that the Office of Information and Regulatory Affairs in the Office of Management and Budget (OMB) will review all significant rules. The Office of Information and Regulatory Affairs has determined that this rule is not significant.

Executive Order 13563 reaffirms the principles of E.O. 12866 while calling for improvements in the nation's regulatory system to promote predictability, to reduce uncertainty, and to use the best, most innovative, and least burdensome tools for achieving regulatory ends. The executive order directs agencies to consider regulatory approaches that reduce burdens and maintain flexibility and freedom of choice for the public where these approaches are relevant, feasible, and consistent with regulatory objectives. E.O. 13563 emphasizes further that

regulations must be based on the best available science and that the rulemaking process must allow for public participation and an open exchange of ideas. We have developed this rule in a manner consistent with these requirements.

*Regulatory Flexibility Act (5 U.S.C. 601 et seq.)*

Under the Regulatory Flexibility Act (RFA; 5 U.S.C. 601 *et seq*.), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA; 5 U.S.C. 801 *et seq.*), whenever an agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effects of the rule on small entities (*i.e*., small businesses, small organizations, and small government jurisdictions). However, no regulatory flexibility analysis is required if the head of the agency certifies the rule will not have a significant economic impact on a substantial number of small entities. The SBREFA amended the RFA to require Federal agencies to provide a certification statement of the factual basis for certifying that the rule will not have a significant economic impact on a substantial number of small entities.

According to the Small Business Administration, small entities include small organizations such as independent nonprofit organizations; small governmental jurisdictions, including school boards and city and town governments that serve fewer than 50,000 residents; and small businesses (13 CFR 121.201). Small businesses include manufacturing and mining concerns with fewer than 500 employees, wholesale trade entities with fewer than 100 employees, retail and service businesses with less than $5 million in annual sales, general and heavy construction businesses with less than $27.5 million in annual business, special trade contractors doing less than $11.5 million in annual business, and agricultural businesses with annual sales less than $750,000. To determine if potential economic impacts to these small entities are significant, we considered the types of activities that might trigger regulatory impacts under this designation as well as types of project modifications that may result. In general, the

term “significant economic impact” is meant to apply to a typical small business firm’s business operations.

The Service’s current understanding of the requirements under the RFA, as amended, and following recent court decisions, is that Federal agencies are only required to evaluate the potential incremental impacts of rulemaking on those entities directly regulated by the rulemaking itself, and, therefore, are not required to evaluate the potential impacts to indirectly regulated entities. The regulatory mechanism through which critical habitat protections are realized is section 7 of the Act, which requires Federal agencies, in consultation with the Service, to ensure that any action authorized, funded, or carried out by the agency is not likely to destroy or adversely modify critical habitat. Therefore, under section 7, only Federal action agencies are directly subject to the specific regulatory requirement (avoiding destruction and adverse modification) imposed by critical habitat designation. Consequently, it is our position that only Federal action agencies would be directly regulated by this designation. There is no requirement under RFA to evaluate the potential impacts to entities not directly regulated. Moreover, Federal agencies are not small entities. Therefore, because no small entities would be directly regulated by this rulemaking, the Service certifies that the final critical habitat designation will not have a significant economic impact on a substantial number of small entities.

During the development of this final rule we reviewed and evaluated all information submitted during the comment period that may pertain to our consideration of the probable incremental economic impacts of this critical habitat designation. Based on this information, we affirm our certification that this final critical habitat designation will not have a significant economic impact on a substantial number of small entities, and a regulatory flexibility analysis is not required.

*Energy Supply, Distribution, or Use—Executive Order 13211*

Executive Order 13211 (Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use) requires agencies to prepare Statements of Energy Effects

when undertaking certain actions. OMB has provided guidance for implementing this Executive Order that outlines nine outcomes that may constitute "a significant adverse effect" when compared to not taking the regulatory action under consideration. The economic analysis finds that none of these criteria are relevant to this analysis. Thus, based on information in the economic analysis, energy-related impacts associated with slenderclaw crayfish conservation activities within critical habitat are not expected. As such, the designation of critical habitat is not expected to significantly affect energy supplies, distribution, or use. Therefore, this action is not a significant energy action, and no Statement of Energy Effects is required.

*Unfunded Mandates Reform Act (2 U.S.C. 1501 et seq.)*

In accordance with the Unfunded Mandates Reform Act (2 U.S.C. 1501 *et seq*.), we make the following findings:

(1) This rule would not produce a Federal mandate. In general, a Federal mandate is a provision in legislation, statute, or regulation that would impose an enforceable duty upon State, local, or tribal governments, or the private sector, and includes both "Federal intergovernmental mandates" and "Federal private sector mandates." These terms are defined in 2 U.S.C. 658(5)–(7). "Federal intergovernmental mandate" includes a regulation that "would impose an enforceable duty upon State, local, or tribal governments" with two exceptions. It excludes "a condition of Federal assistance." It also excludes "a duty arising from participation in a voluntary Federal program," unless the regulation "relates to a then-existing Federal program under which $500,000,000 or more is provided annually to State, local, and Tribal governments under entitlement authority," if the provision would "increase the stringency of conditions of assistance" or "place caps upon, or otherwise decrease, the Federal Government's responsibility to provide funding," and the State, local, or Tribal governments "lack authority" to adjust accordingly. At the time of enactment, these entitlement programs were: Medicaid; Aid to Families with Dependent Children work programs; Child Nutrition; Food Stamps; Social Services Block Grants; Vocational Rehabilitation State Grants; Foster Care, Adoption

Assistance, and Independent Living; Family Support Welfare Services; and Child Support Enforcement. "Federal private sector mandate" includes a regulation that "would impose an enforceable duty upon the private sector, except (i) a condition of Federal assistance or (ii) a duty arising from participation in a voluntary Federal program."

The designation of critical habitat does not impose a legally binding duty on non-Federal Government entities or private parties. Under the Act, the only regulatory effect is that Federal agencies must ensure that their actions do not destroy or adversely modify critical habitat under section 7. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency. Furthermore, to the extent that non-Federal entities are indirectly impacted because they receive Federal assistance or participate in a voluntary Federal aid program, the Unfunded Mandates Reform Act would not apply, nor would critical habitat shift the costs of the large entitlement programs listed above onto State governments.

(2) We conclude that this rule would not significantly or uniquely affect small governments because the lands within and adjacent to the streams being designated as critical habitat are owned by private landowners. These government entities do not fit the definition of "small governmental jurisdiction." Consequently, we conclude that the critical habitat designation would not significantly or uniquely affect small government entities. As such, a Small Government Agency Plan is not required.

*Takings—Executive Order 12630*

In accordance with E.O. 12630 (Government Actions and Interference with Constitutionally Protected Private Property Rights), we have analyzed the potential takings implications of designating critical habitat for slenderclaw crayfish in a takings implications assessment. The Act does not authorize the Service to regulate private actions on private lands

or confiscate private property as a result of critical habitat designation. Designation of critical habitat does not affect land ownership, or establish any closures, or restrictions on use of or access to the designated areas. Furthermore, the designation of critical habitat does not affect landowner actions that do not require Federal funding or permits, nor does it preclude development of habitat conservation programs or issuance of incidental take permits to permit actions that do require Federal funding or permits to go forward. However, Federal agencies are prohibited from carrying out, funding, or authorizing actions that would destroy or adversely modify critical habitat. A takings implications assessment has been completed and concludes that this designation of critical habitat for slenderclaw crayfish does not pose significant takings implications for lands within or affected by the designation.

*Federalism—Executive Order 13132*

In accordance with E.O. 13132 (Federalism), this rule does not have significant federalism effects. A federalism summary impact statement is not required. In keeping with Department of the Interior and Department of Commerce policy, we requested information from, and coordinated development of the proposed critical habitat designation with, the appropriate State resource agency in Alabama. We did not receive comments from Alabama. From a federalism perspective, the designation of critical habitat directly affects only the responsibilities of Federal agencies. The Act imposes no other duties with respect to critical habitat, either for States and local governments, or for anyone else. As a result, the rule does not have substantial direct effects either on the State, or on the relationship between the National Government and the State, or on the distribution of powers and responsibilities among the various levels of government. The designation may have some benefit to these governments because the areas that contain the features essential to the conservation of the species are more clearly defined, and the physical or biological features of the habitat necessary to the conservation of the species are specifically identified. This information does not alter where and what federally sponsored activities may occur. However, it may assist these local governments in long-range planning

(because these local governments no longer have to wait for case-by-case section 7 consultations to occur).

Where State and local governments require approval or authorization from a Federal agency for actions that may affect critical habitat, consultation under section 7(a)(2) of the Act would be required. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency.

*Civil Justice Reform—Executive Order 12988*

In accordance with Executive Order 12988 (Civil Justice Reform), the Office of the Solicitor has determined that the rule does not unduly burden the judicial system and that it meets the requirements of sections 3(a) and 3(b)(2) of the order. We are designating critical habitat in accordance with the provisions of the Act. To assist the public in understanding the habitat needs of the species, this rule identifies the elements of physical or biological features essential to the conservation of the species. The designated areas of critical habitat are presented on maps, and the rule provides several options for the interested public to obtain more detailed location information, if desired.

*Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.)*

This rule does not contain any new collections of information that require approval by the Office of Management and Budget under the Paperwork Reduction Act of 1995. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

*National Environmental Policy Act (42 U.S.C. 4321 et seq.)*

We have determined that environmental assessments and environmental impact statements, as defined under the authority of the National Environmental Policy Act (NEPA), need not be prepared in connection with listing a species as an endangered or threatened species

under the Act. We published a notice outlining our reasons for this determination in the *Federal Register* on October 25, 1983 (48 FR 49244).

It is our position that, outside the jurisdiction of the U.S. Court of Appeals for the Tenth Circuit, we do not need to prepare environmental analyses pursuant to NEPA in connection with designating critical habitat under the Act. We published a notice outlining our reasons for this determination in the *Federal Register* on October 25, 1983 (48 FR 49244). This position was upheld by the U.S. Court of Appeals for the Ninth Circuit (*Douglas County* v. *Babbitt*, 48 F.3d 1495 (9th Cir. 1995), cert. denied 516 U.S. 1042 (1996)).

*Government-to-Government Relationship with Tribes*

In accordance with the President's memorandum of April 29, 1994 (Government-to-Government Relations with Native American Tribal Governments; 59 FR 22951), Executive Order 13175 (Consultation and Coordination With Indian Tribal Governments), and the Department of the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with recognized Federal Tribes on a government-to-government basis. In accordance with Secretarial Order 3206 of June 5, 1997 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act), we readily acknowledge our responsibilities to work directly with Tribes in developing programs for healthy ecosystems, to acknowledge that Tribal lands are not subject to the same controls as Federal public lands, to remain sensitive to Indian culture, and to make information available to Tribes. We have identified no Tribal interests that will be affected by this final rulemaking.

**References Cited**

A complete list of references cited in the SSA report and this rulemaking is available on the Internet at *http://www.regulations.gov* under Docket No. FWS–R4–ES–2018–0069 and upon request from the Alabama Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

**Authors**

The primary authors of this final rule are the staff members of the U.S. Fish and Wildlife Service Species Assessment Team and Alabama Ecological Services Field Office.

**List of Subjects in 50 CFR Part 17**

Endangered and threatened species, Exports, Imports, Reporting and recordkeeping requirements, Transportation.

**Regulation Promulgation**

Accordingly, we amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

**PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS**

1. The authority citation for part 17 continues to read as follows:

AUTHORITY: 16 U.S.C. 1361–1407; 1531–1544; and 4201–4245, unless otherwise noted.

2. Amend §17.11(h) by adding an entry for "Crayfish, slenderclaw" to the List of Endangered and Threatened Wildlife in alphabetical order under CRUSTACEANS to read as follows:

**§ 17.11 Endangered and threatened wildlife.**

* * * * *

(h) * * *

| Common name | Scientific name | Where listed | Status | Listing citations and applicable rules |
|---|---|---|---|---|
| * * * * * * * | | | | |
| CRUSTACEANS | | | | |
| * * * * * * * | | | | |
| Crayfish, slenderclaw | *Cambarus cracens* | Wherever found | E | 86 FR [INSERT *FEDERAL REGISTER* PAGE WHERE THE DOCUMENT BEGINS], [INSERT DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]; 50 CFR 17.95(h)$^{CH}$. |
| * * * * * * * | | | | |

3. Amend § 17.95(h) by adding an entry for "SLENDERCLAW CRAYFISH (*CAMBARUS*

*CRACENS*)" after the entry for "PECOS AMPHIPOD (*GAMMARUS PECOS*)" to read as follows:

**§ 17.95 Critical habitat—fish and wildlife.**

* * * * *

(h) * * *

SLENDERCLAW CRAYFISH (*CAMBARUS CRACENS*)

(1) Critical habitat units are depicted for DeKalb and Marshall Counties, Alabama, on the maps in this entry.

(2) Within these areas, the physical or biological features essential to the conservation of the slenderclaw crayfish consist of the following components:

(i) Geomorphically stable, small to medium, flowing streams:

(A) That are typically 19.8 feet (ft) (6 meters (m)) wide or smaller;

(B) With attributes ranging from:

(*1*) Streams with predominantly large boulders and fractured bedrock, with widths from 16.4 to 19.7 ft (5 to 6 m), low to no turbidity, and depths up to 2.3 ft (0.7 m); to

(*2*) Streams dominated by small substrate types with a mix of cobble, gravel, and sand, with widths of approximately 9.8 feet (3 m), low to no turbidity, and depths up to 0.5 feet (0.15 m);

(C) With substrate consisting of boulder and cobble containing abundant interstitial spaces for sheltering and breeding; and

(D) With intact riparian cover to maintain stream morphology and to reduce erosion and sediment inputs.

(ii) Seasonal water flows, or a hydrologic flow regime (which includes the severity, frequency, duration, and seasonality of discharge over time), necessary to maintain benthic habitats where the species is found and to maintain connectivity of streams with the floodplain, allowing the exchange of nutrients and sediment for maintenance of the crayfish's habitat and food availability.

(iii) Appropriate water and sediment quality (including, but not limited to, conductivity; hardness; turbidity; temperature; pH; and minimal levels of ammonia, heavy metals, pesticides, animal waste products, and nitrogen, phosphorus, and potassium fertilizers) necessary to sustain natural physiological processes for normal behavior, growth, and viability of all life stages.

(iv) Prey base of aquatic macroinvertebrates and detritus. Prey items may include, but are not limited to, insect larvae, snails and their eggs, fish and their eggs, and plant and animal detritus.

(3) Critical habitat does not include manmade structures (such as buildings, aqueducts, runways, roads, and other paved areas) and the land on which they are located existing within the legal boundaries on [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

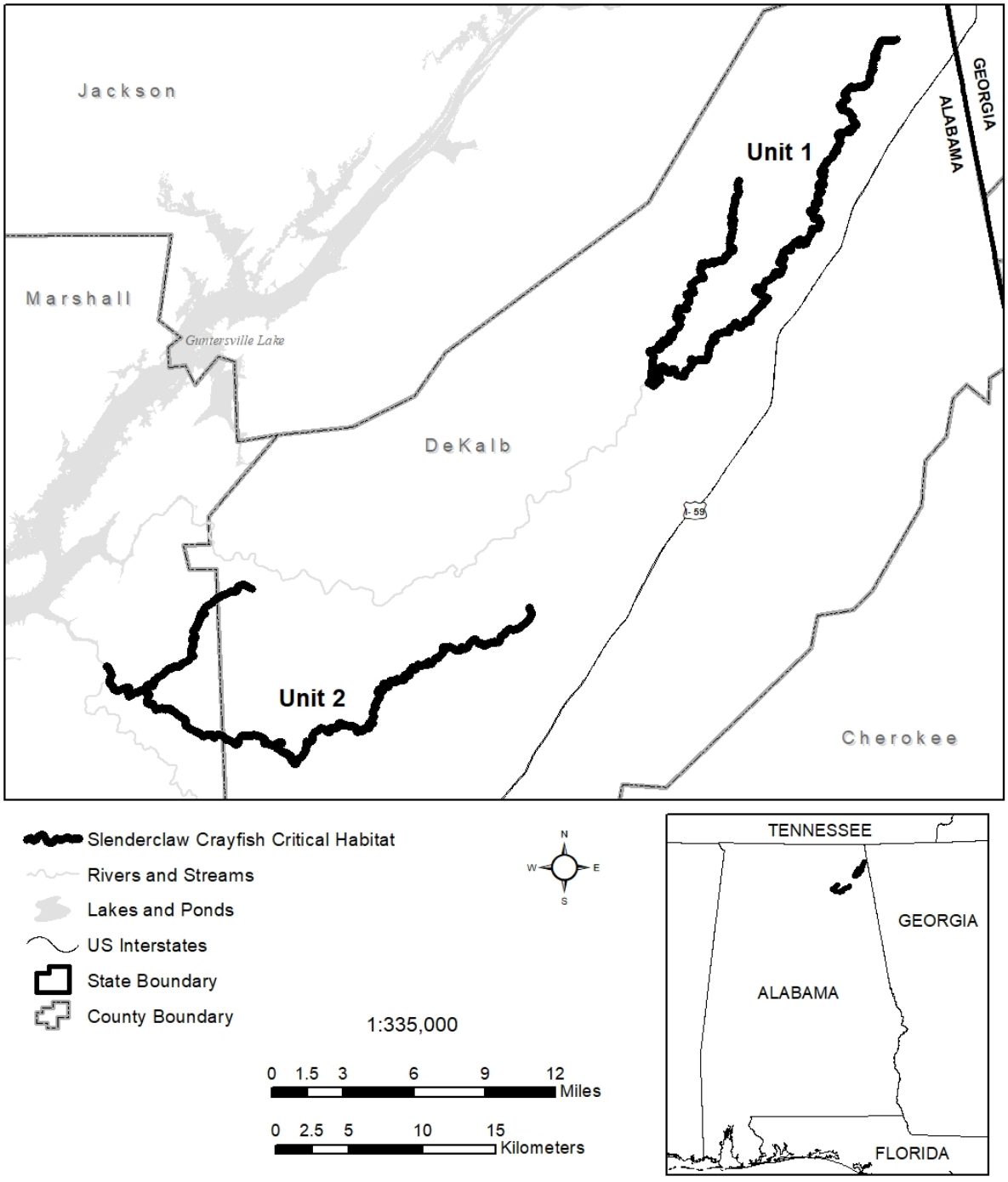
(4) Data layers defining map units were created using Universal Transverse Mercator (UTM) Zone 16N coordinates and species' occurrence data. The hydrologic data used in the maps were extracted from U.S. Geological Survey National Hydrography Dataset High Resolution (1:24,000 scale) using Geographic Coordinate System North American 1983 coordinates. The maps in this entry, as modified by any accompanying regulatory text, establish the boundaries of the critical habitat designation. The coordinates or plot points or both on which each map is based are available to the public at *http://www.regulations.gov* under Docket No. FWS–R4–ES–2018–0069 and at the field office responsible for this designation. You may obtain field office location information by contacting one of the Service regional offices, the addresses of which are listed at 50 CFR 2.2.

(5) Note: Index map follows:

**Slenderclaw Crayfish (*Cambarus cracens*)**

Critical Habitat Index Map

Marshall and DeKalb Counties, Alabama

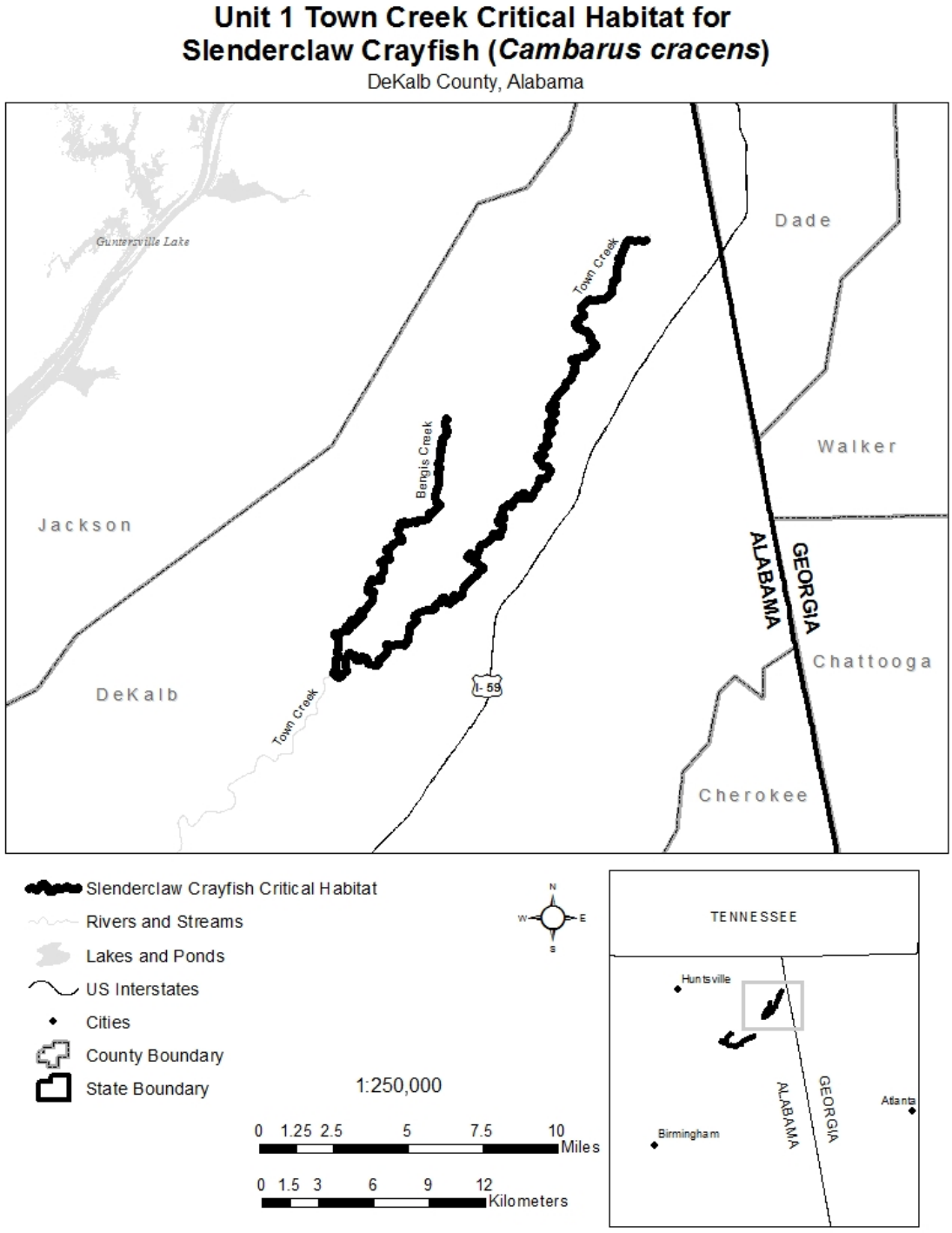



(6) Unit 1: Town Creek, DeKalb County, Alabama.

(i) This unit consists of 41.8 river miles (67.2 river kilometers) of occupied habitat in Bengis and Town Creeks. Unit 1 includes stream habitat up to bank full height consisting of the

headwaters of Bengis Creek to its confluence with Town Creek and upstream to the headwaters of Town Creek.

(ii) Map of Unit 1 follows:




(7) Unit 2: Short Creek, DeKalb and Marshall Counties, Alabama.

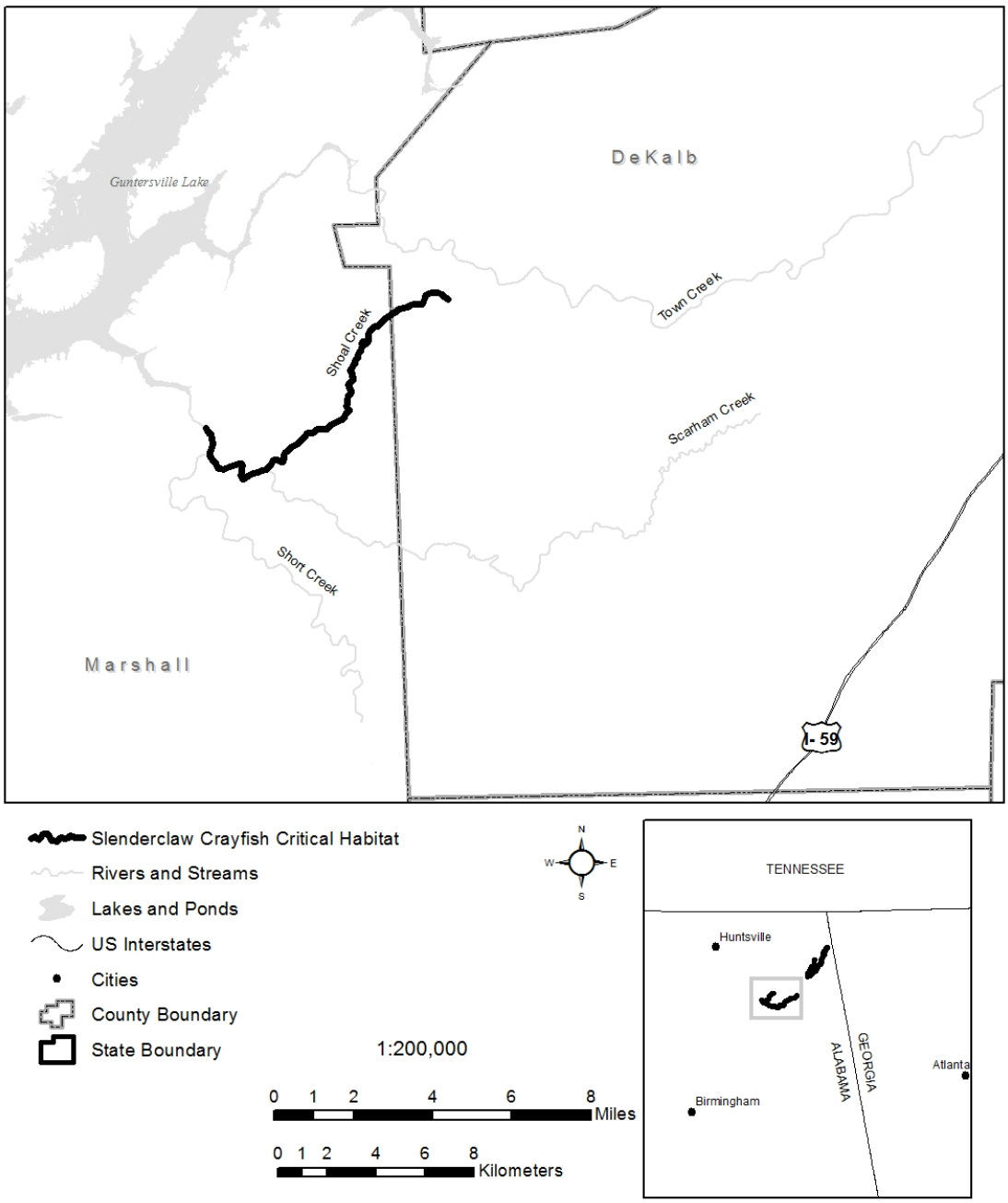
(i) Subunit 2a: Shoal Creek and Short Creek, DeKalb and Marshall Counties, Alabama.

(A) This subunit consists of 10.3 river miles (16.6 river kilometers) of occupied habitat in Scarham, Shoal, Short, and Whippoorwill Creeks. Subunit 2a includes stream habitat up to bank full height consisting of the headwaters of Shoal Creek to its confluence with Whippoorwill Creek, Whippoorwill Creek to its confluence with Scarham Creek, Scarham Creek to its confluence with Short Creek, and Short Creek to its downstream extent to the Guntersville Lake Tennessee Valley Authority project boundary.

(B) Map of Subunit 2a follows:

**Subunit 2a: Shoal Creek and Short Creek Critical Habitat for Slenderclaw Crayfish (*Cambarus cracens*)**

DeKalb and Marshall Counties, Alabama




(ii) Subunit 2b: Scarham-Laurel Creek, DeKalb and Marshall Counties, Alabama.

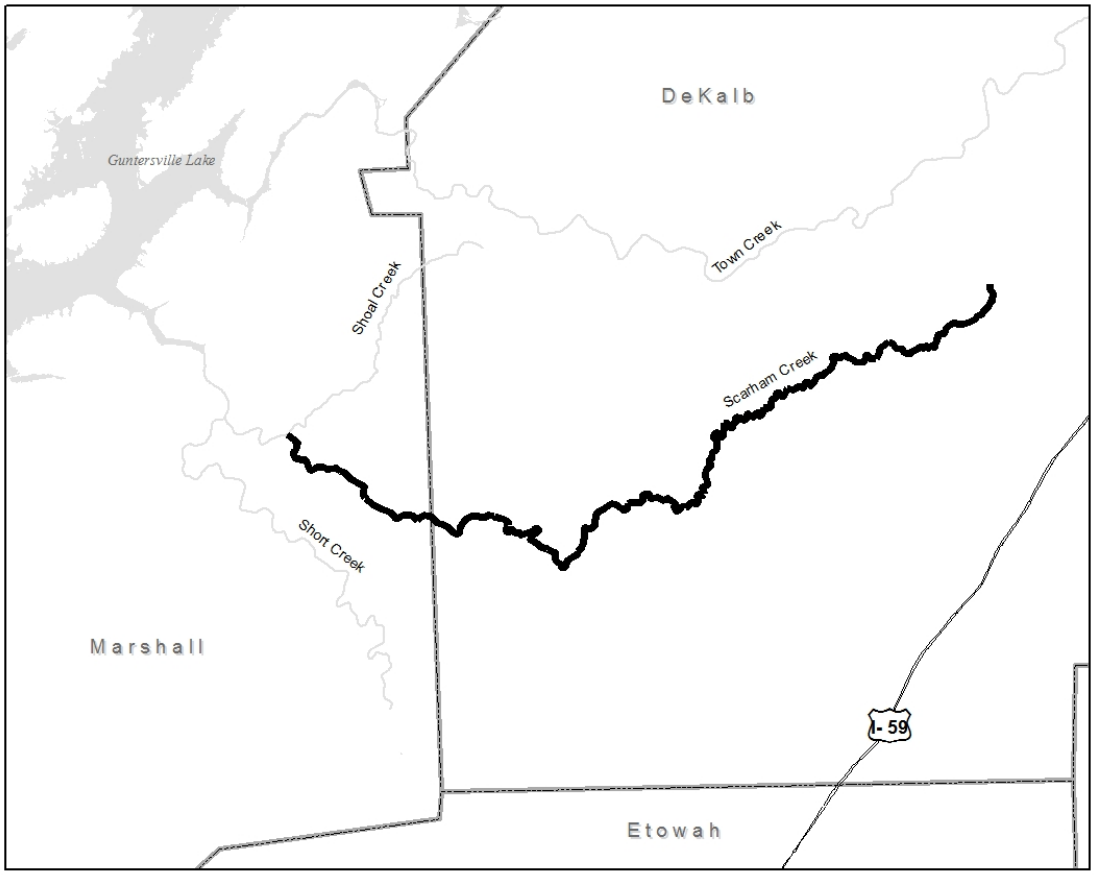
(A) This subunit consists of 25.9 river miles (41.7 river kilometers) of unoccupied habitat in Scarham-Laurel Creek. Subunit 2b includes stream habitat up to bank full height consisting of the headwaters of Scarham-Laurel Creek to its confluence with Whippoorwill

Creek. This subunit is a small to medium, flowing stream with substrate consisting of boulder and cobble containing interstitial spaces for sheltering and breeding and connected to the occupied subunit 2a.

(B) Map of Subunit 2b follows:

**Subunit 2b: Scarham-Laurel Creek Critical Habitat for Slenderclaw Crayfish (*Cambarus cracens*)**

DeKalb and Marshall Counties, Alabama



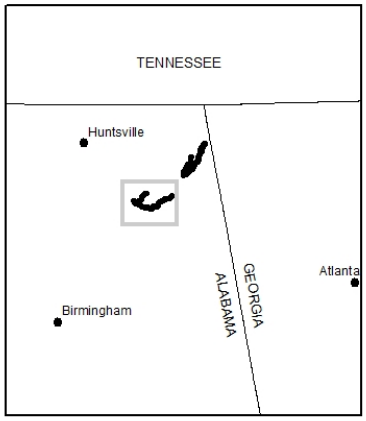

Slenderclaw Crayfish Critical Habitat
Rivers and Streams
Lakes and Ponds
US Interstates
Cities
County Boundary
State Boundary

N
W
E
S

1:200,000

0 1 2 4 6 8 Miles

0 1 2 4 6 8 Kilometers



* * * * *

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**Martha Williams,**
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*Exercising the Delegated Authority of the Director,*
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[FR Doc. 2021-19093 Filed: 9/7/2021 8:45 am; Publication Date: 9/8/2021]